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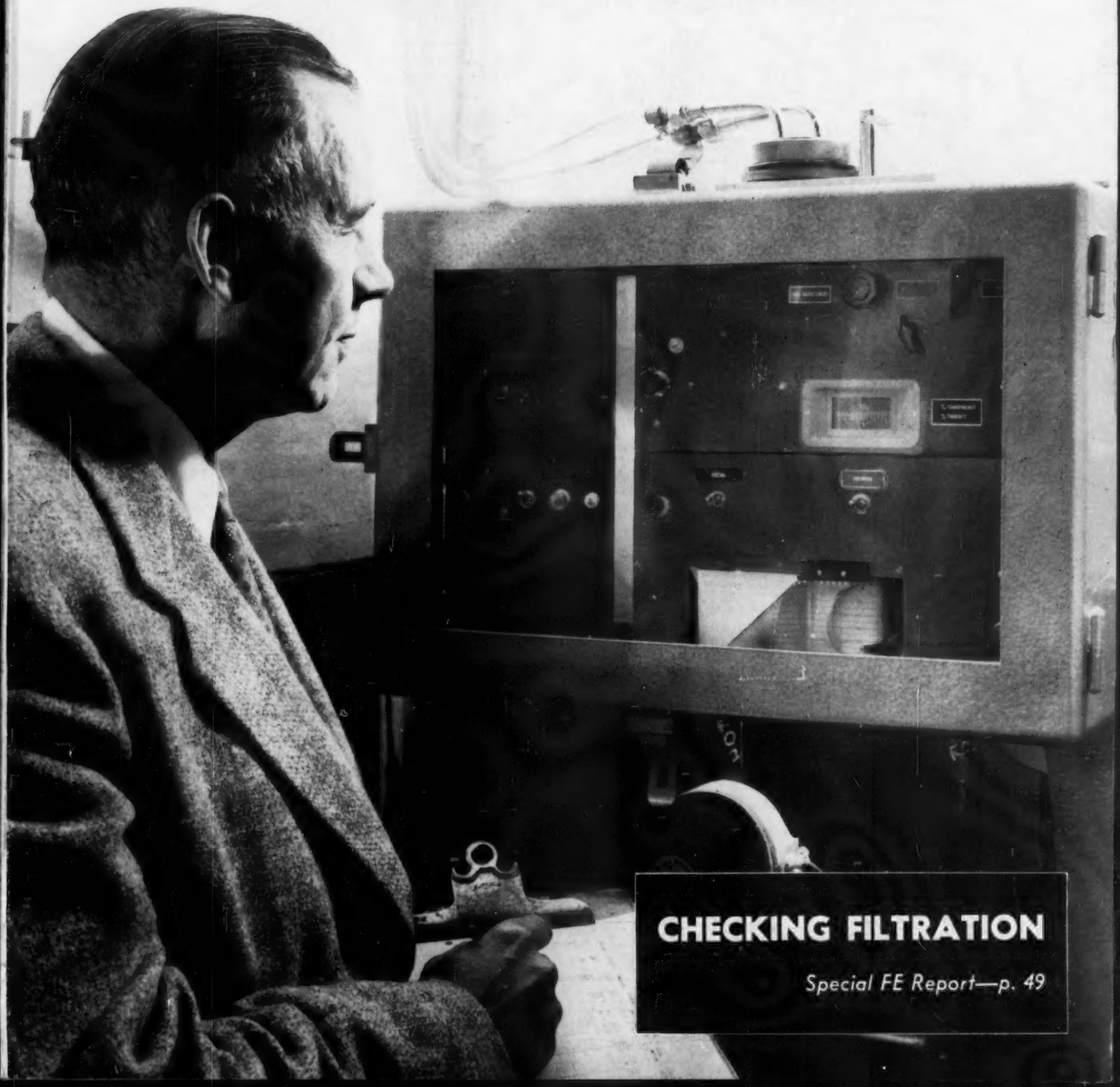
JULY 1960

$1.00

# FOOD ENGINEERING

BETTER MANAGEMENT IN MANUFACTURING, PACKAGING, MARKETING

A CHILTON PUBLICATION



## CHECKING FILTRATION

*Special FE Report—p. 49*

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If your food product requires enrichment, color, flavor... then STERWIN can help you save time, money, labor . . . so give you more profit.

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FOR MANAGEMENT

JULY 1960

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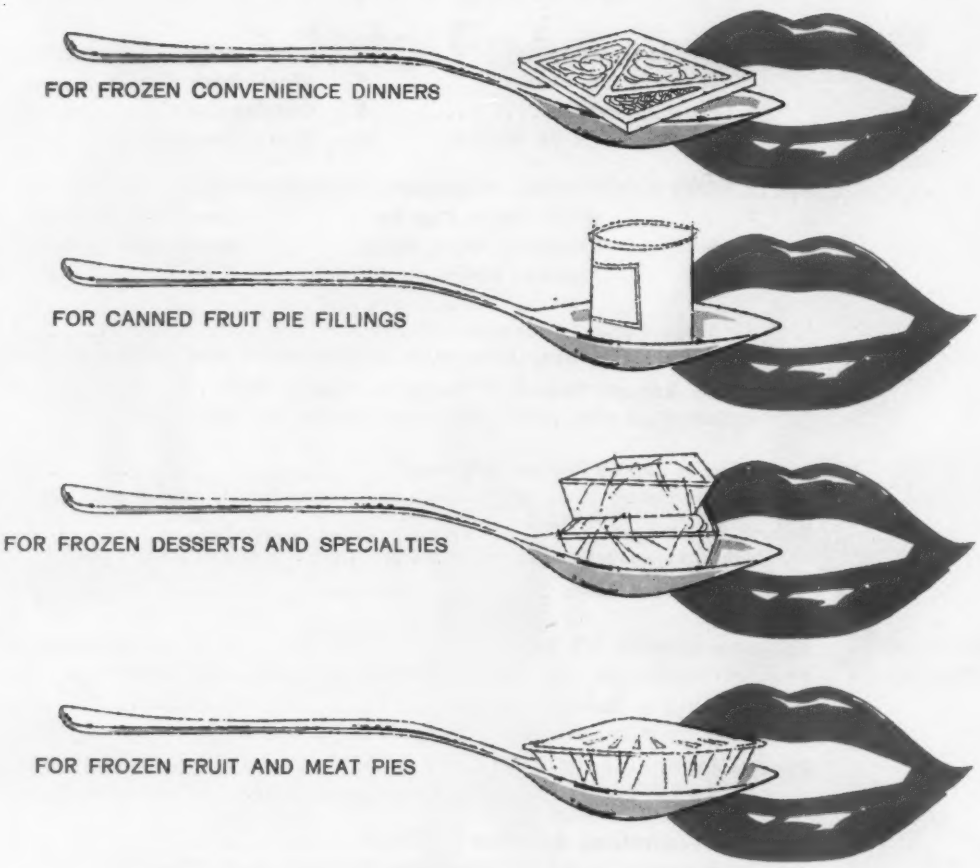
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FOR FROZEN DESSERTS AND SPECIALTIES
FOR FROZEN FRUIT AND MEAT PIES

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COL-FLO 67—canned or frozen—never imparts an undertone of cereal taste. Never interferes with natural food flavors.

UNMATCHED STABILITY. Col-Flo 67 safeguards and improves stability. All tests show far greater resistance to freeze-thaw breakdown than wheat flour or other waxy starches.

EXCELLENT CLARITY. Col-Flo 67 doesn't cloud natural colors between processing and eating. An appealing crystal clear glossiness highlights your food product.

A simple taste comparison quickly emphasizes the advantages of tasteless Col-Flo 67. Write for details, telling us something of the use you have in mind.

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FOOD ENGINEERING (formerly Food Industries) July, 1960, Vol. 32, No. 7.

Published monthly by Chilton Company; Executive, Editorial, Circulation and Advertising Offices, Chestnut & 56th Sts., Phila. 39, Pa., Second class postage paid at Philadelphia, Pa.

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Subscriptions are solicited only from men with management responsibility in manufacturing, marketing, packaging, engineering, and technology in companies engaged in food manufacturing. Position and company connection must be indicated on subscription orders. Send to Circulation Manager. Rates: U. S. Possessions and Canada for individuals in field of publication, $2.00 per year, single copies $1; all other foreign $25.00 per year.

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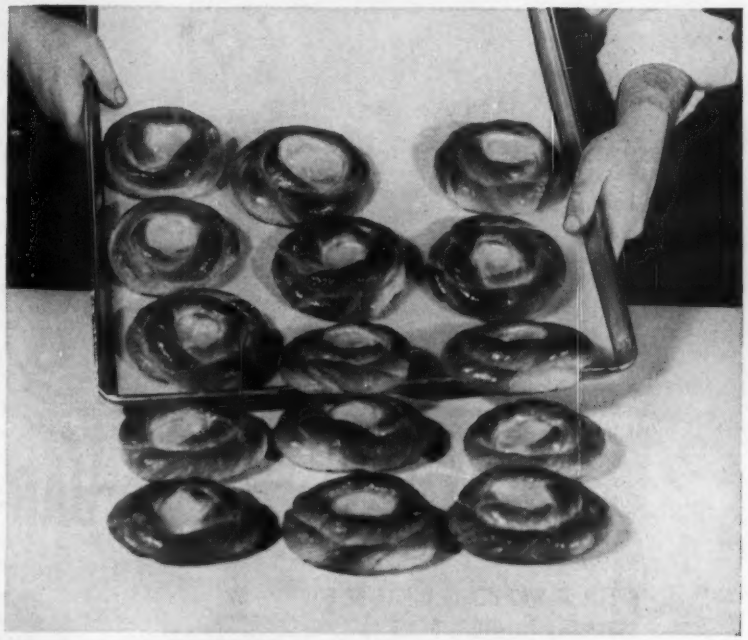
SAVES TWO STEPS IN THE BAKING PROCESS

METAL BAKING PANS REQUIRE TWO THINGS: GREASING BEFORE USING HARD SCRUBBING AFTER.

ELIMINATE BOTH WITH PATAPAR BAKERY PAN LINERS



• Simply place a Patapar Bakery Pan Liner in each pan before it goes into the oven. When cooking is finished, foods come away from the liner without sticking. There's nothing left clinging to the metal. The pan is ready for immediate use again . . . and again.

Patapar Bakery Pan Liners are available in all standard baking pan sizes. Why not try them? Send for free sample package of liners.

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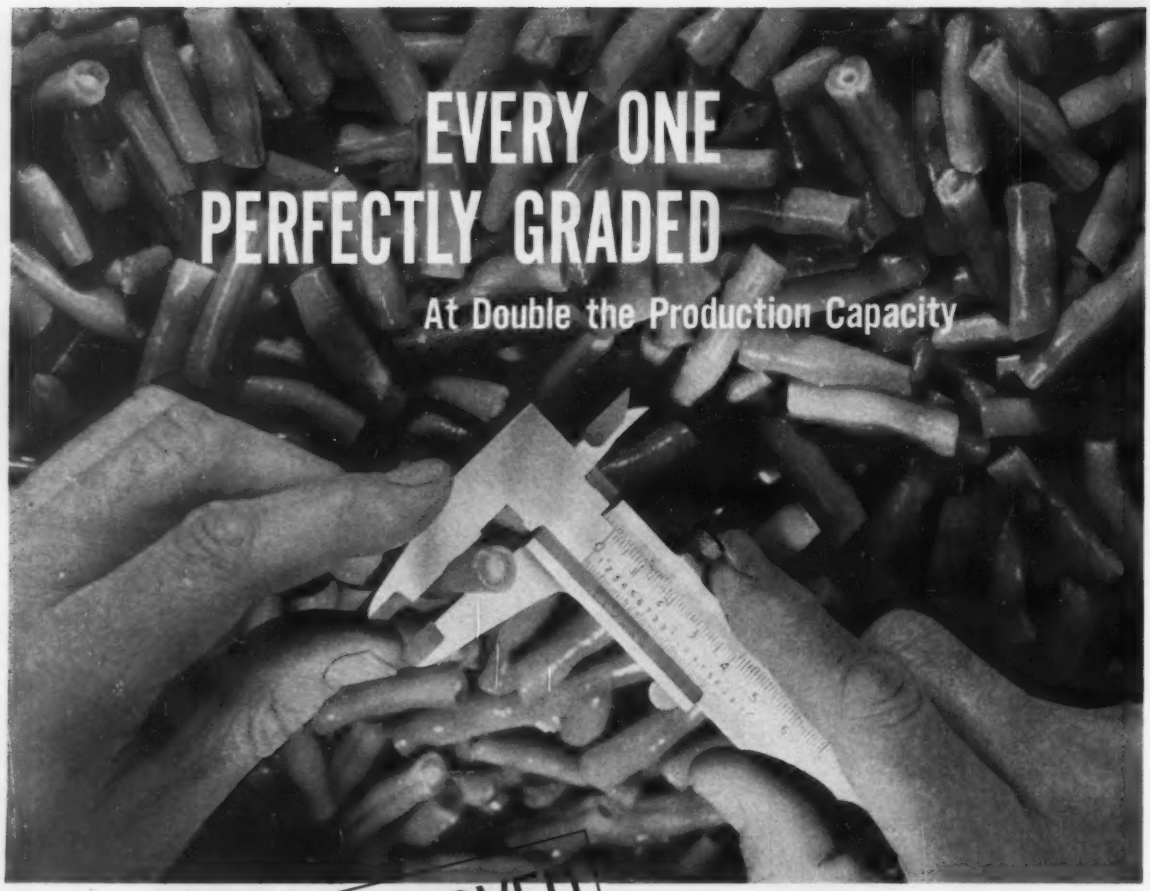


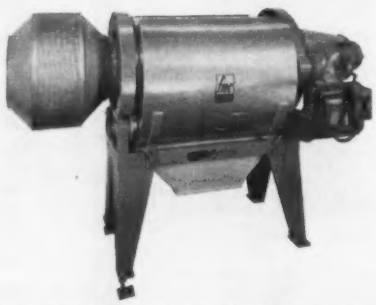

# fmc IMPROVED BAR-TYPE GRADER

- GREEN OR WAX BEANS, WHOLE OR CUT
- STRIP-CUT POTATOES, PLAIN OR CRINKLE
- DICED OR SLICED CLINGSTONE PEACHES
- SIMILAR DICED OR SLICED PRODUCTS

Based on practical field experience, and operation of several hundred units during the past three seasons, FMC now offers an improved model of its highly efficient Bar-Type Grader. Employing the original FMC principle that actually doubles production capacity of conventional types, the improved machine now incorporates these new features:

- Increased area between side guards and grading drum provides for free fall of product, prevents hangup.
- Increased capacity with no increase in floor space.
- Positive ring gear drive prevents slipping, even under full load.
- Single cam action provides smoother operation, less wear.
- Duthane trunnions are used, for increased machine life and super-quiet operation.

And there are many more. Get all the facts on this efficient grader today. Write for information, or call your FMC representative.



The improved FMC Horizontal Bar-Type Grader is available in single grader for two separations, or double grader with three, for size-grading by diameter and in accordance with U.S. Standards. Capacities up to 3400 lbs. per hr. on whole green beans; up to 4200 lbs. on cut beans.

*Putting Ideas to Work*

FOOD MACHINERY AND CHEMICAL CORPORATION

**Canning Machinery Division**

General Sales Offices:

WESTERN: SAN JOSE, CALIF. • EASTERN: HOOPESTON, ILL.

# TRENDS & FORECASTS

SPECIAL FOOD SERVICE to EXECUTIVES

**Food manufacturers expect sales during second half** of year to top same period in '59 by 4.1%, according to survey by FE. For year, expected increase is 3.9%. Profits are forecast 3% higher. Increase in tonnage is put at 4.7%.

**Capital investment by food manufacturers increased from $8,500** per production worker to $13,000 between '46 and '50 GMA reports. In next decade, investment rose another 50% to nearly $20,000.

**Wage rates for food factory workers climbed 50% from '50 to '59.** Because of improved efficiency unit labor costs gained only 25%.

**Hourly earnings of food plant production workers** continue to climb, reaching $2.19 per hour in April, for increase of 9 cents over last year. Weekly wages were $2.30 above '59 level.

**Export of crude and manufactured foodstuffs for first quarter** amounted to $651 million dollars, up 12% over same period of '59.

**Increase in exports of manufactured foods amounted to 22%** for first quarter, compared to gain of 7% for crude foodstuffs.

**Dollar sales of retail food stores during first quarter of '60** rose 3% over same period of '59. March sales were 5% ahead of '59.

**Transportation savings of 10 to 15% and more are being achieved** by companies using modern shipping methods, such as piggyback.

**By 1980, persons of age 65 and over will constitute 10%** of population, according to Department of Commerce estimates. Those in 1 to 19 year group will account for 40%.

**Candy manufacturers are optimistic. Sales increases** are anticipated by 74.3% of companies surveyed by National Confectioners Association.

**Canned apple pack increased from 3.6 million cases** in the '58-'59 season to 4 million in '59-'60, NCA reports. Applesauce gained from 16 million to 17.2 million cases. Apple juice rose from 5.3 million cases to 6.8 million.

**Acreage of nine vegetable crops for processing is about 1%** higher than last year, according to USDA. Biggest increases are: green lima beans, 15%; cabbage for kraut, 14%.

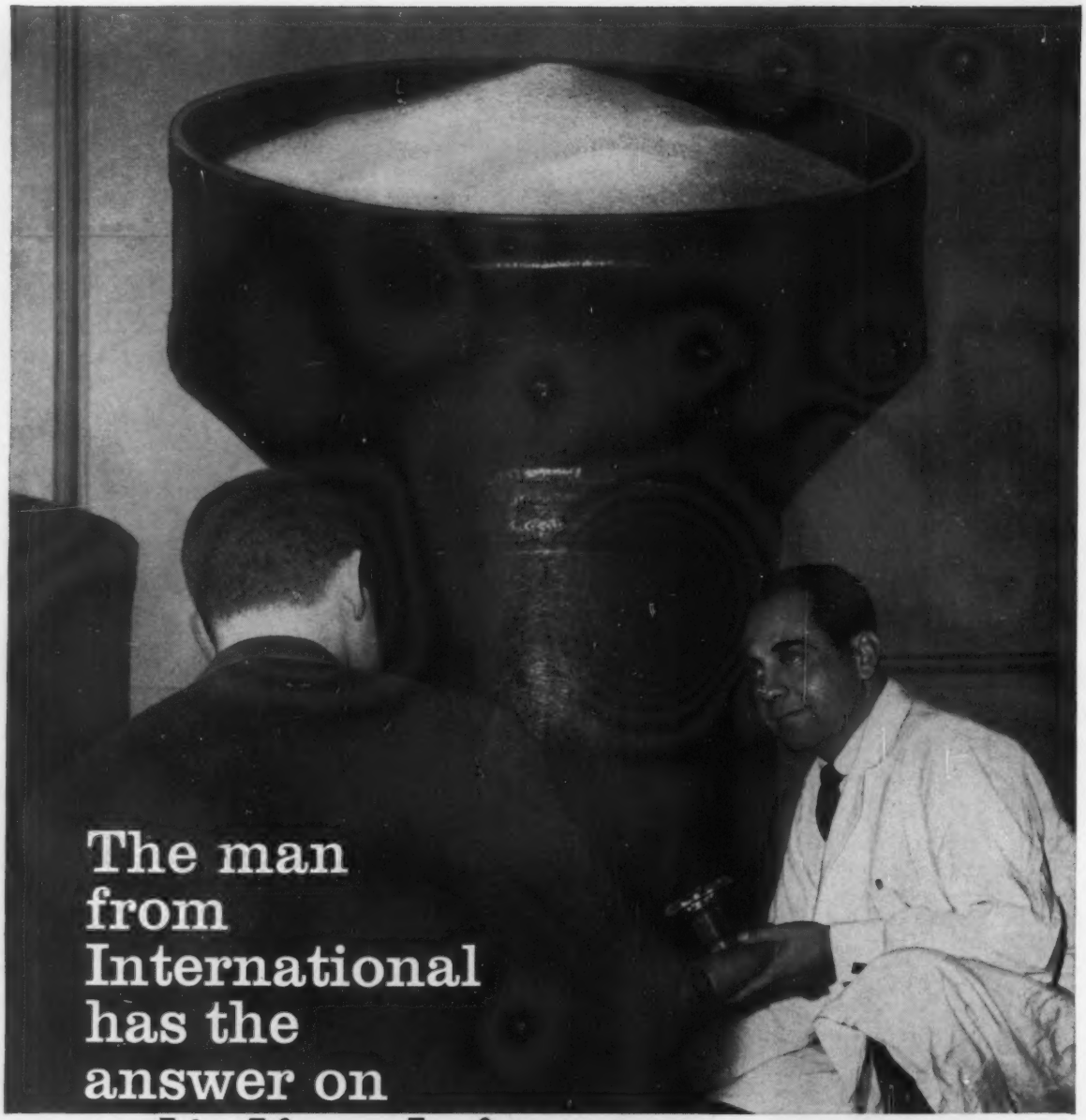
**New record per capita consumption of 199.8 bottles was achieved** by soft drinks last year, according to ABCB. This represents 9.2% increase. Value of '59 sales, wholesale, was $1.6 billion.

**Production of red meat for the first 4 months of '60** was up 6% over a year ago to 8.98 billion lb, according to USDA. Beef gained 8%, veal 7%, pork 5%. Lamb and mutton declined 4%.

**Production of onions exceeded 2½ billion lb.,** for per capita figure of 14.29 lb., last year. This is an increase of 37% over the 1919-54 average, according to Consolidated Foods.

**Per capita consumption of fish and shellfish amounted to 10.7 lb.** in '59, about same as in '58, but 0.6 lb. higher than in '57, Bureau of Commercial Fisheries reports.

See Developments to Watch p. 13



# The man from International has the answer on salt dissolving

Here, the man from International Salt Company checks the rate of flow of a newly installed plastic Sterling Lixator* as his customer looks on, smiling. Reason for the smile: he's thinking of the time and money he'll save, thanks to this new salt-dissolving system. The exclusive Sterling Lixator is the most efficient and economical rock-salt dissolver ever developed. It simplifies the entire brine-making process, combining salt-storage, dissolving and brine self-filtration in one *automatic* operation. Lixate Brine is crystal-clear, fully saturated—and the only source of power used to produce it is gravity—which costs nothing. For expert advice on the particular Lixator for your needs, contact International Salt Company, headquarters, Clarks Summit, Pa. District offices: Boston, Buffalo, Charlotte, Chicago, Cincinnati, Detroit, Newark, New Orleans, New York, Phila., Pittsburgh, St. Louis.

*Registered T.M. of International Salt Company

**INTERNATIONAL STERLING SALT SALT COMPANY**

"A STEP AHEAD IN SALT TECHNOLOGY"

## Schedule of Events

July

19-21—Western Packaging & Materials Handling Exposition; Pan Pacific Auditorium, Los Angeles.

19-20—National Food Brokers Assn., management conference; Shoreham and Sheraton Park Hotels, Washington, D. C.

22-25—American Spice Trade Assn., convention; Shawnee Inn, Shawnee-on-Delaware, Pa.

24-26—American Society of Quality Control, convention; San Francisco.

25-27—International Apple Assn., convention; Fontainebleau Hotel, Miami Beach.

31-A1—National Candy Wholesalers Assn., convention; Shoreham and Sheraton Park Hotels, Washington, D. C.

August

15-19—National Dietary Foods Assn., convention; Americana Hotel, Miami Beach.

21-24—National Assn. for Specialty Food Trade, Fancy Food & Confection Show; Astor Hotel, N. Y. C.

## HORS D'OEUVRES

**Present rate of population growth will leave standing room only on the earth seven centuries from now. Good news for hot dog concessionaires.**

Chemistry, irrigation, and food from the sea should keep Malthus in the wrong as population explodes. Problem may be to find room to bury the dead, not to find food for the living.

**Euripides, the Greek poet, said: "Where there is no wine, there is no love." Too bad the Russians prefer vodka.**

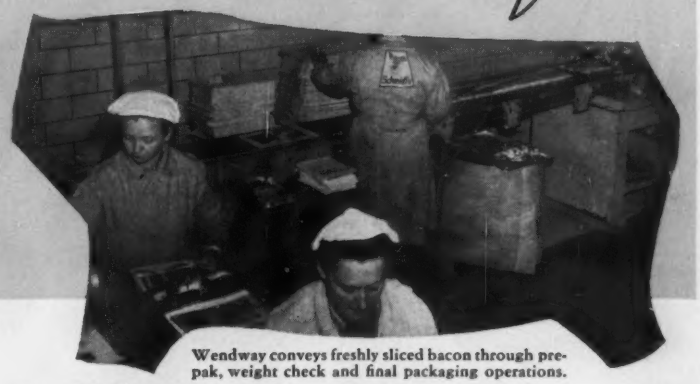
Life expectancy of a 40-year-old American male is but 2 years longer than half a century ago. Among reasons are too much smoking, eating, and excitement. But we live while we live.

**Californians are expected to eat 337 eggs per capita this year. They apparently will oversleep breakfast occasionally.**

Your dollar is worth only 28.84¢ compared to the buck your father earned in 1900. Inflation has erased all but the "ar."

**A Cornell scientist finds that normal women vary widely in amount of body fat. Quite a difference in the way they carry it, too.**


NO MATTER HOW YOU SLICE IT.....

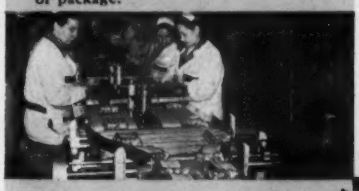


Wendway conveys freshly sliced bacon through prepak, weight check and final packaging operations.

WENDWAY CUTS MEAT HANDLING COSTS!

Narrow belt Wendway systems are ideal for processing, labeling, packaging and inspection of delicate products, cartons.

Wendway is the practical answer for conveying fresh, unwrapped food products. Belting will not mar product or package.



Wendway belting is available in a wide selection of standard widths to match every requirement.

Wendway is the one versatile conveying system that gained the complete acceptance of the nation's top processing and packing plants. Wendway's stainless steel wire belting is ideal for the conveying of meats or other food products—packaged or unpackaged. It permits free circulation of air from above or below, does not sag or accumulate fats or grease and can be kept highly sanitary with hot water or steam scalding.

A Wendway system in your plant will quickly pay for itself in tangible, provable savings of man hours, floor space and the elimination of multiple handling. All...while conveying your products swiftly, silently, safely and *economically* to any desired location.

*Prove it to yourself, investigate Wendway today!*

UNION STEEL PRODUCTS CO.
*Industrial Conveyor Division*
ALBION, MICHIGAN

Overhead cooling for cooked or heated products saves time, handling and floor space. Wendway is unaffected by temperature extremes.

*Write today...* for additional information, literature and specifications to match your conveying requirements.

Garden Supplies
ELECTRIC CLOCK
GARDE
GLOVES
GARDEN

# How to put a show on the road

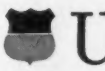
Charles "Chuck" Newman is an old hand at packaging showmanship. And an extraordinarily versatile one, too. As Union-Camp's Art Director for 26 years he's helped develop successful package designs for a wide variety of products.

"Chuck" and his talented team operate on the premise that every shipping container should be a traveling salesman for the products it carries as well as for the company that ships them. And there's certainly no lack of prospects. The average corrugated box, in its travels, meets hundreds of people and makes thousands of impressions. Yet its valuable billboard space often is neglected.

Distinctively designed boxes, as "Chuck" has demonstrated over and over, can work in dozens of ways. To merchandise a brand name—help create an image or personality for the product. Or, to tie-in with special or seasonal promotions. To dovetail with other advertising. To develop dealer preference by simplifying and speeding identification in inventory control. And through the combination of structural and visual design, to serve as eye-catching, easy-to-assemble display pieces—right at the point of sale.

But remember, designing art and print copy for corrugated boxes is a job for experts. It's an exacting medium to work with. How well your design succeeds depends, to a great extent, upon how well the artist knows the intricacies of the process and how to get the most out of it. "Chuck" Newman has a lifetime of experience in getting "the most" out of paper packaging and his staff is trained to his own high standards.

Your Union-Camp corrugated box representative is your passkey to more effective use of printed corrugated boxes. He'll be happy to show how they can be of value to you. A note on your letterhead will bring him to your office.



UNION-CAMP®

CORRUGATED BOXES

Union Bag-Camp Paper Corporation · 233 Broadway N.Y. 7, N.Y.

**Plants:** Savannah, Georgia · Trenton, New Jersey · Chicago, Illinois · Lakeland, Florida · Spartanburg, South Carolina · Jamestown, North Carolina
**Subsidiaries:** Allied Container Corporation, Dedham, Massachusetts
The Eastern Box Company, Baltimore, Maryland.

KEEP FAITH WITH NATURE—GUARD HER GOODNESS

# Beta CAROTENE

'NATURE'S YELLOW'

## the Versatile Color

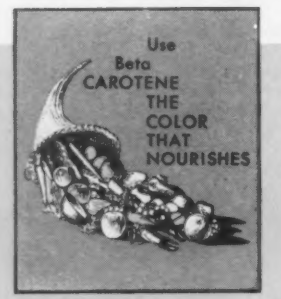
*RECOGNIZED*
*SAFE AS A NUTRIENT—SAFE AS A COLOR*

| | | |
|---|---|---|
| | **ACTIVITY** | Beta CAROTENE is the color that nourishes. Its vitamin A activity is 1,666,660 U.S.P. units per gram. |
| + | **AVAILABILITY** | Six practical, convenient forms for every food use. |
| + | **MISCIBILITY** | In either water-base or oil-base foods. |
| + | **POTENCY** | Greater color values that count, from a small amount. |
| + | **PURITY** | Virtually 100% pure. Free from useless extractives or residues. |
| + | **QUALITY** | Achieved by meeting the most exacting specifications. |
| + | **SAFETY** | Recognized safe as a nutrient. Accepted in U.S.A. and many other countries. |
| + | **UNIFORMITY** | Standardized, unchanging, true color, lot after lot. No tinge of green or red. |
| + | **UTILITY** | Recommended for foods and beverages requiring yellow to orange color. |

**Add up to *versatility* for Beta CAROTENE**
**the Color that Nourishes**

**USE IT FOR**
Margarine • Shortening
Salad and Cooking Oils
Mellorine & Ice Cream Products
Pie Crust & Cake Mixes
Baked Goods • Frozen Foods
Fruit Drinks, Fruit Juices & Concentrates
Puddings & Egg Yolk Products
Gelatine Desserts • Confections
Dessert Toppings • Popcorn
Cheese • Soups • Creamed Foods

*Send for samples and technical literature.*

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# DEVELOPMENTS TO WATCH

SPECIAL FOOD ENGINEERING SERVICE to EXECUTIVES

**Two synthetic sterols are highly effective in reducing blood cholesterol.** They were found by Eastman Kodak researchers.

**Addition of non-decayed organic matter,** calcium, and potassium to soils inhibits plant uptake of fission products, say U. of California scientists.

**New vitamin boosts fowl growth 8-25%** in tests at Texas Agricultural Experiment Station. They're tiny white crystals from distillers' dried solubles.

**Edible oils prove valuable as antidotes for radiation sickness,** according to J. K. Ashikawa, U. of California. He finds that mice can survive lethal doses of X-rays through injection of edible vegetable oils.

**Acid-resistant molded plastic caps to protect bolts** used in food storage silos have been developed. These are made of Kralastic, resin rubber plastic, made by Naugatuck Chemical Division of U. S. Rubber Co.

**New punched-card automatic warehouse installed by Colgate-Palmolive** has potential application in food industry for making up orders. System consists of live storage racks and conveyors actuated by an electronic director and control system.

**Painless method for transporting kosher beef cattle** from pens to slaughtering station is under development by Armour Research Foundation. Plan is to carry animals in sling-type device.

**Milk can made of plastic, molded into one piece, is Swedish** development. Interior is smooth for easy cleaning, and flexible walls avoid dents and noise in handling.

**Labor is saved by mechanical device developed in England** to place meat carcasses on suspended rails in delivery trucks. It also enables truck driver to unload vehicle without entering it. Power operated arm lifts carcasses to and from rails.

**Canned juice from red grapefruit is acceptable to consumers** when fortified with pulp to maintain its color, according to USDA tests. When the juice is not fortified, it sometimes becomes discolored.

**New container for milk sampling is sterile polyethylene bag** with wire closure. Inexpensive, it eliminates washing, sterilizing, and breakage.

**Tamperproof seal holds protective plastic cap over valve** of Tropicana's aerosol juice can. It also protects nozzle against contamination. Bands can be applied by machine, or by hand, at 30 to 60 per min. per operator.

**New tomato variety developed by Campbell Soup gave high yield** of 35.1 tons per acre in tests, and is resistant to wilt diseases. Campbell also has a new slender podded strain of okra with skeleton leaf characteristics that make picking easier.

**Electronic shear press facilitates determination of product firmness** and indicates results on scale and chart. It is being used for a wide variety of products, including fruits and vegetables, meats and poultry, fish and dog biscuit.

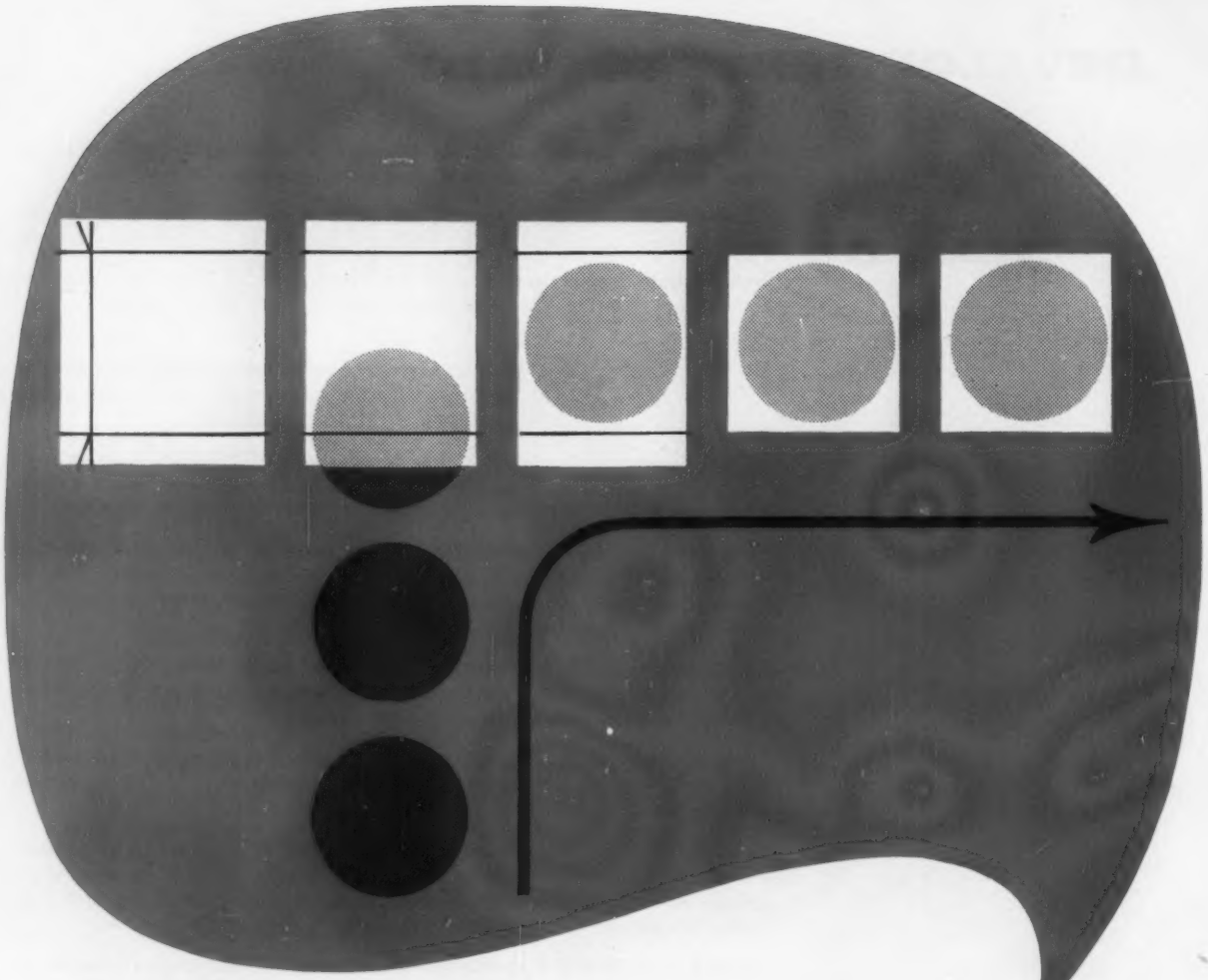
**"Instant bread" is made in 45 min. instead of 5 to 6 hr.** Special additives enhance aroma and taste. Dry ingredients require only addition of water and mixing.

**New feed additive, diallyl, improves meat tenderness and quality** and speeds rate of gain in beef cattle. Tests with additive were made at Washington State University.

**Vacuum freeze-drying equipment is being built** for Canada's Defense Research Medical Lab. at Toronto. Freeze-drying of raw meats, cooked meats, and vegetables will be researched.

See Who's Building What p. 17

Washington Report p. 25



KEY TO MASS MARKETS: PACKAGING SYSTEMS . . . The big new world of mass merchandising and mass selling depends on high ratios of production to meet volume demand. This calls for packages which can be automatically set up, formed, filled and closed at high speeds. CCA cartons, **plus** high-speed machines developed through CCA's Machinery Development Department, are helping manufacturers meet mass market demands. To **pack it—move it—sell it** is the business of CCA packaging.

**CONTAINER CORPORATION OF AMERICA**
Chicago 3 . . . and all key marketing areas

CCA

**Folding Cartons, Shipping Containers, Sefton Fibre Cans, Molded Plastic Products, Point-of-Purchase Displays, Paperboard**



CIRCLE 14 ON READER SERVICE CARD

CIRCLE 15 ON READER SERVICE CARD ➔

HOW TO LEAD THE
"DIETETIC FOODS" PARADE

# GELS WITHOUT SUGAR

Low-calorie jams...
dietetic fruit jells...aspics...
relishes...sauces...desserts...

NOW you can make delicious sugar-free gelled foods that even the most conscientious weight-watcher or diabetic can enjoy—with Exchange Low Methoxyl Pectin...the only pectin that forms a true gel without sugar.

Pectin L.M.—an exclusive Sunkist citrus research development—improves appearance and flavor, too. It gives sparkling brilliance and desirable tenderness and elasticity to gels that remain firm at room temperature. Flavorless, it does not absorb or adsorb flavor.

*Get full information*—including technical data and formulas. Call your Sunkist man or write Sunkist Growers, Products Sales Dept., 720 East Sunkist Street, Ontario, Calif.

**Sunkist Growers**

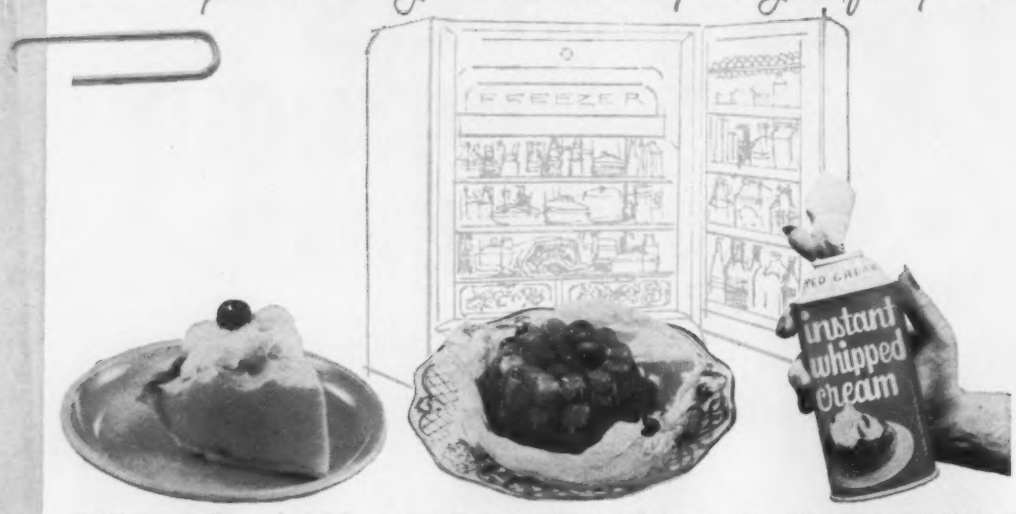
Exchange

KELCO COMPANY

KELCO REG. U.S. PAT. OFF. REFINED ALGIN PRODUCTS

technical bulletin

*Use unique Kelco Algin Colloids to improve your food products*




**Use Keltone In Pre-packaged Dry-Mix** — Chiffons, meringues and other fillings look fresh and stay fresh far longer. Keltone produces a smoother, creamier texture. Makes preparation easier.

**Use Kelco-Gel HV In Salad And Dessert Gels** — Made in 3 minutes, cold if desired, and gelling in half-hour, or less, salad and dessert gels made with Kelco-Gel HV are clear, sparkling and tender — won't melt at room temperatures. Mold release is fast and clean.

**Use Kelco Algin Colloids In Pressurized Foods** — Effectively stabilized with Kelco Algin colloids, aerosol-dispensed whipped toppings, syrups, flavors and sauces have far longer shelf life.

# No More Effective Way to Make Foods Stay Fresh Longer

## Unique Kelco Algin Colloids Help You Create New Food Products

For example, less than 1 teaspoon of Kelco algin per pound of food product produces high volume whip, easier mixing, more tender texture, and retarded weeping (syneresis).

Whatever your product, packaged dry mix or beverage, emulsion or suspension, sauce or syrup, there's a Kelco algin colloid to provide important benefits. At your service, too, are our highly qualified food technicians, ready to give individual attention to your needs or problems.

**YOURS ON REQUEST:** Free samples of Kelco algins, and Technical Data describing properties, advantages, and uses in *your* application. Write without obligation to your nearest Kelco regional office.

**Keltone® Kelco-Gel HV® Kelco-Gel LV®** ***products of*** **Kelco Company**

75 Terminal Avenue, Clark, New Jersey • 20 N. Wacker Drive, Chicago 6, Illinois • 530 W. Sixth Street, Los Angeles 14, Calif.
Cable Address: KELCOALGIN — CLARKNEWJERSEY

# WHO'S BUILDING WHAT...

**Monthly Report: Food firms to spend $2,453,172 for expansion.**

## Proposed Work

**Coca-Cola Bottling Co.**, Durham, N. C., bottling plant, $200,000; Lumberton, N. C., bottling plant, $150,000; Sumter, S. C., bottling plant, $200,000.

**Dixie Frozen Foods, Inc.**, Atlanta, Ga., meat processing plant, $160,000.

**The Lucky Lager Brewing Co.**, Houston, Texas, brewery, $7,775,000.

**Oscar Mayer Co.**, Houston, Texas, meat distribution plant, $200,000.

**National Biscuit Co.**, West Haven, Conn., warehouse, $250,000.

**National Dairy Products Corp.**, Levittown, Pa., distribution center addition, $110,000.

**Pepsi-Cola Co.**, Tampa, Fla., bottling plant, $1,000,000.

## Low Bids/Contracts

**Agar Packing Co.**, Chicago, Ill., meat plant addition, $147,000.

**Cal-Ray Bakeries, Inc.**, Bell, Calif., warehouse, $300,000.

**Canada Dry Bottling Corp.**, Atlanta, Ga., warehouse addition, $115,000.

**Coca-Cola Bottling Co.**, Atlanta, Ga., bottling plant addition, $150,000.

**Colville Meats, Inc.**, Colville, Wash., custom killing plant, $135,462.

**Fort Dodge Packing Co.**, Fort Dodge, Iowa, beef abattoir addition, $244,575.

**Kraft Foods, Inc.**, Decatur, Ga., food processing plant addition, $500,000.

**Oscar Mayer & Co.**, Houston, Texas, cooler warehouse, $226,135.

**Old Reading Brewery, Inc.**, Reading, Pa., brewery warehouse, $375,000.

**Sealtest Ice Cream Corp.**, Waterford, Conn., plant, distribution center, $110,000.

**Van De Kamps Bakery**, Los Angeles, Calif., food processing addition, $150,000.

**SA**—streamlined balloon jacket design. Extra large diameter provides greater heating surface. Sizes 15 to 500 gallons. Constructed for steam working pressures of 40, 90 and 125 pounds.

**SA MIX COOKER**—has single or double motion agitator with or without hydraulic lift. Agitator lifts easily and smoothly out of cooker. Sizes 30 to 500 gallons.

**CW**—designed to process batches up to 150 gallons. Positive worm gear. Handwheel gives control of capacity loads while tilting. Large diameter kettle gives fast even cooking.

BUILT-IN QUALITY

... IN HAMILTON SPECIAL OR STANDARD KETTLES ASSURES LOWER PROCESSING COSTS

**PC**—stainless steel pressure cooking kettle for meat and poultry processing. 90 p.s.i. in jacket and 15 p.s.i. in kettle. Quick opening latches. Top is lifted by eccentric lever. Sizes 30 to 250 gallons.

**HV**—vacuum cooker from 150 to 500 gallons. Hinged manhole provides access to the inside. Available with a mixer—circulator can be installed to increase heat transfer and agitation.

**VT**—vacuum cooker has no equal for small batches. Tilting top easy loading. Sizes 30 to 150 gallons. Jacketed for 90 p.s.i. steam working pressure.

**SPECIAL**—PC Style Pressure type mix-cooker. Jacket to full 200 gal. level. Plate type heating-cooking coils arranged to act as agitator baffle plates. Entire unit removable for easy cleaning.

Hamilton offers the right kettle for any mixing or cooking job. The Cost? Reasonable and economical in the light of finished and polished fabrication. Sanitation guaranteed. Careful competent workmanship and constant inspection assures you of quality that is built-in. We'll work from your prints or create them for you on our drawing boards. Write for free Hamilton Kettle Catalogue.

ESTABLISHED 1876

HAMILTON Kettles

COPPER AND BRASS WORKS

DIVISION OF BRIGHTON CORP.

820 STATE AVENUE, CINCINNATI 4, OHIO

## The Importance of Logic in Packaging Machine Design.

*The most successful packaging machine is the most simple in concept. Unnecessary complexity invariably taxes itself in speed, performance, efficiency and maintenance.*

*Triangle originally entered the bag making, filling and sealing field to develop a single tube machine. No other consideration was allowed to complicate the basic requirements. That's why Triangle's single tube machine has been so unusually successful.*

*What could be a more logical starting place for developing a multi-tube bag maker, filler and sealer . . . ?*

# NOW TRIANGLE MORE THAN DOUBLES THE ADVANTAGE OF ITS REMARKABLE BAG MAKER, FILLER AND SEALER!

Regardless of whose equipment you're using or whether you're presently considering equipment purchase, you owe it to yourself to investigate the new Triangle Twin machine. The reason? It has all of the advantages, all of the flexibility, all of the efficiency our single tube equipment has without any of the disadvantages common to all other dual tube machines.

Briefly, Here's Why . . .

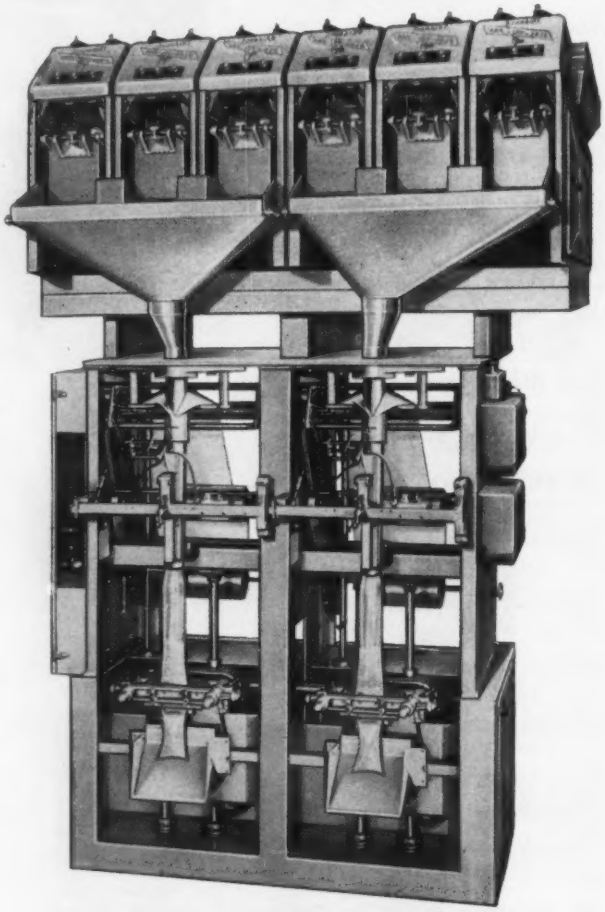
The Triangle Twin is fast . . . 120 bags per minute with any bag material (90 per minute with polyethylene). It will handle a full range of bag sizes up to 8" x 16".

The Triangle Twin is a fully integrated combination of two, efficient single tube machines with one common drive . . . yet sealing jaws operate independently to permit one side to operate while the other side is down for film threading or routine maintenance. This feature results in *less* downtime and more production than normally expected.

The Triangle Twin mounts up to *six* Elec-Tri-Pak net weighing scales on top where they belong. No costly intermediate elevator feed is required. Volumetric filler and other synchronized systems are also available.

The Triangle Twin has all the performance of the time proven single tube bag maker and filler . . . fast, simple changeover for all materials from cellophane to polyethylene . . . quick return jaw assembly . . . simple, functional design of sealing jaws. . .

See for yourself how far the Triangle Twin has advanced the concept of high speed bag making, filling and sealing. Write today—without obligation, of course.



. . . . . YOU REALLY 37 YEARS SAVE WITH . . . . . .

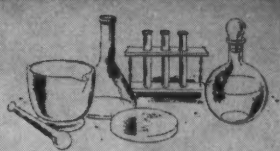
F-7L22

**TRIANGLE PACKAGE MACHINERY COMPANY**

6637 West Diversey Avenue, Chicago 35, Illinois • Telephone: TUxedo 9-0200

# *Creative vision begins to work for you in this research center devoted to the planning of things to come*

NATIONAL DAIRY RESEARCH INSTITUTE, GLENVIEW, ILLINOIS



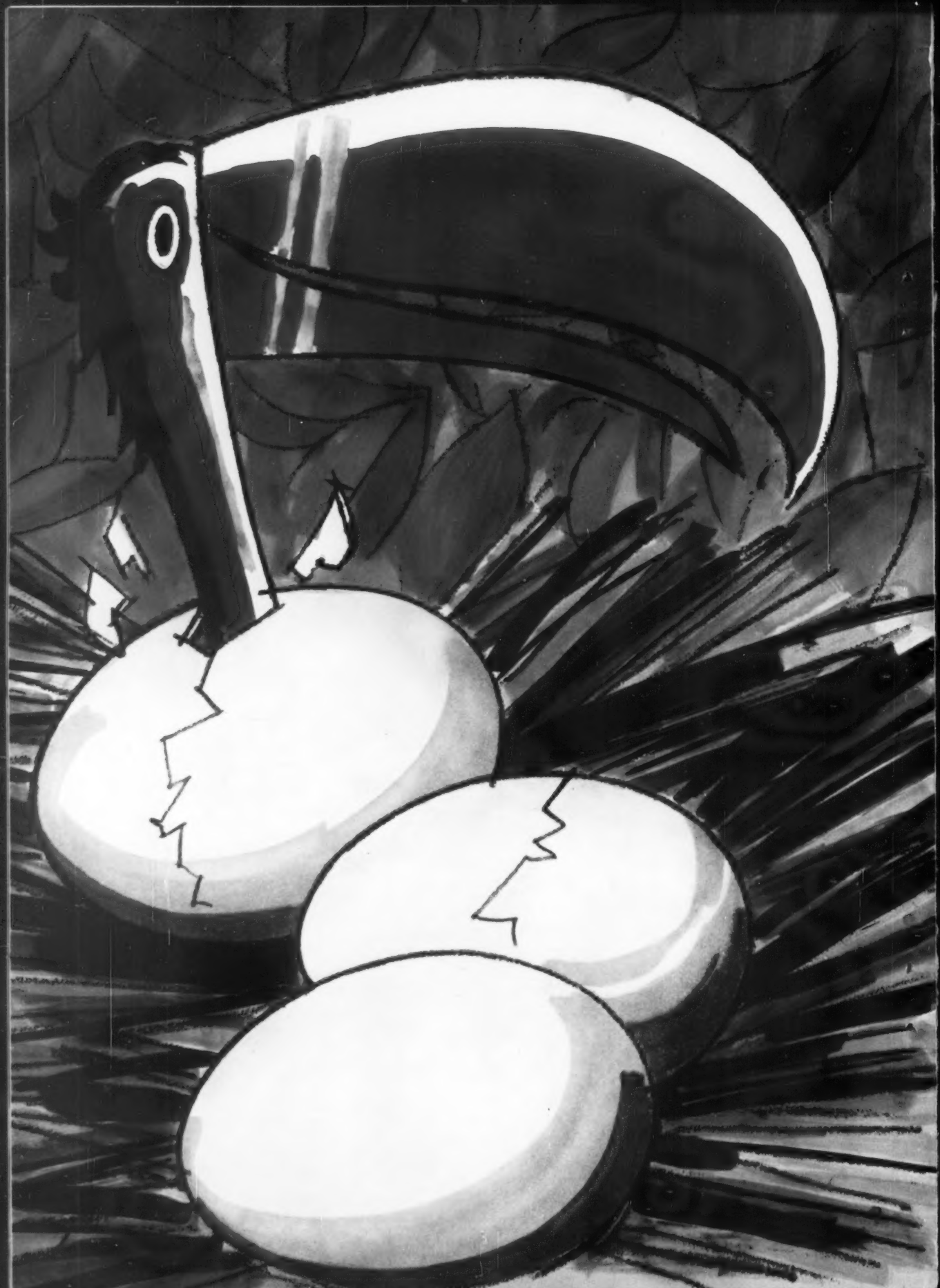
**SHEFFIELD CHEMICAL**
Norwich, N.Y.
A DIVISION OF NATIONAL DAIRY PRODUCTS CORPORATION

Serving the food, pharmaceutical and biological industries

**PROTEIN TECHNOLOGY THROUGH CONTINUING RESEARCH IN MILK AND MILK DERIVATIVES**

CIRCLE 19 ON READER SERVICE CARD

CIRCLE 21 ON READER SERVICE CARD →



# The Perfect Container doesn't Just Happen!

THINKERS may debate "which came first," but no one denies that Mother Nature gave us the perfect package when she created the egg . . . a container that does what it's supposed to do . . . best!

**New products, packages and profits!**

In the food field, Canco develops the containers that do what they're supposed to do . . . best! Not by hit, miss or guess, but by completely understanding a manufacturer's product and his packaging problems. A timely example is Canco's new, popular "String-Pull" Biscuit container that provides easier opening and greater product protection. Another example could be your new package. In laboratories, test kitchens and factories, Canco specialists are right now solving packaging problems like yours . . . solutions which will add to the long line of container "firsts" and "bests" from Canco.

For greater sales and profits put Canco's research, manufacturing facilities and aggressive marketing team to work for your products.

GREAT CONTAINER IDEAS COME FROM CANCO

CANCO DIVISION
AMERICAN CAN COMPANY

# STEPHENS-ADAMSON

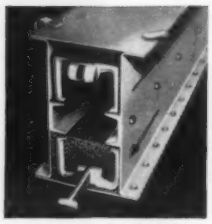
## BELT CONVEYOR SYSTEM saves leading food processor up to $90,000 in year's operation

"World's Longest Grain Belt Conveyor," a half-mile STEPHENS-ADAMSON Belt Conveyor System at the A. E. Staley Mfg. Co., Decatur, Illinois, saved its owner nearly $90,000.00 in its first year of operation.

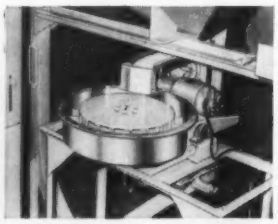
The conveyor system moves up to 224 tons of corn hourly — 192,000 bushels a day — from below the 2 million bushel capacity terminal elevator to the top of the processing plant holding elevator a half mile away.

Besides speeding corn handling to an equivalent of 100 grain cars per day, the installation provides a transfer system with better control, assures cleanliness of the corn, and eliminates spillage. Reduced handling costs per ton have resulted in considerable savings in over-all operating expenses.

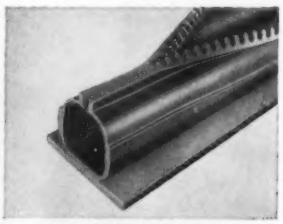
**S-A ENGINEERED CONVEYOR PRODUCTS FOR FOOD HANDLING SYSTEMS**



S-A REDLER CONVEYOR-ELEVATORS BULLETIN 358



S-A CONTINUOUS WEIGHER BULLETIN 958



S-A "ZIPPER" CLOSED-BELT CONVEYOR-ELEVATOR BULLETIN 349

WRITE FOR LITERATURE LISTED

S-A

ENGINEERED BULK HANDLING SYSTEMS
MATERIALS HANDLING PRODUCTS
SPEEDWALK® PASSENGER CONVEYORS
SEALMASTER® BALL BEARING UNITS
SPHERCO® BEARINGS & ROD ENDS

ENGINEERING DIVISION

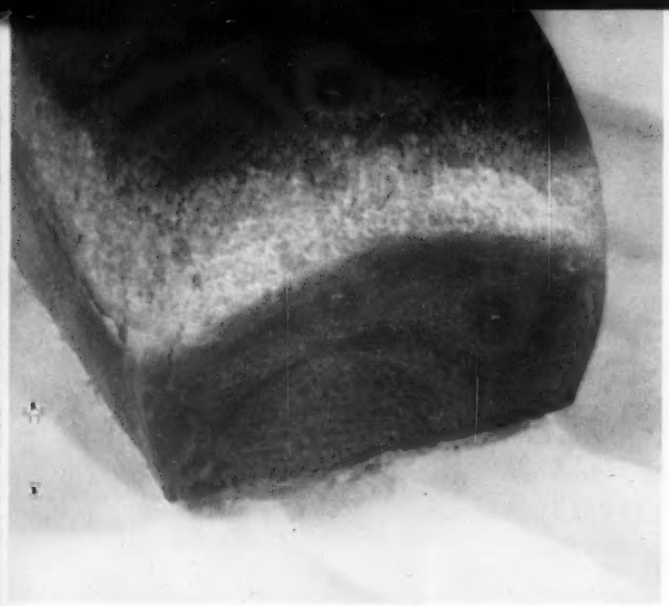
**STEPHENS-ADAMSON MFG. CO.**

GENERAL OFFICE & MAIN PLANT, 6 RIDGEWAY AVENUE, AURORA, ILLINOIS

PLANTS LOCATED IN: LOS ANGELES, CALIFORNIA • CLARKSDALE, MISSISSIPPI
BELLEVILLE, ONTARIO



CIRCLE 23 ON READER SERVICE CARD ➔



*Flavorful, quality, eye-appealing foods...*

*naturally superior...when made with...*

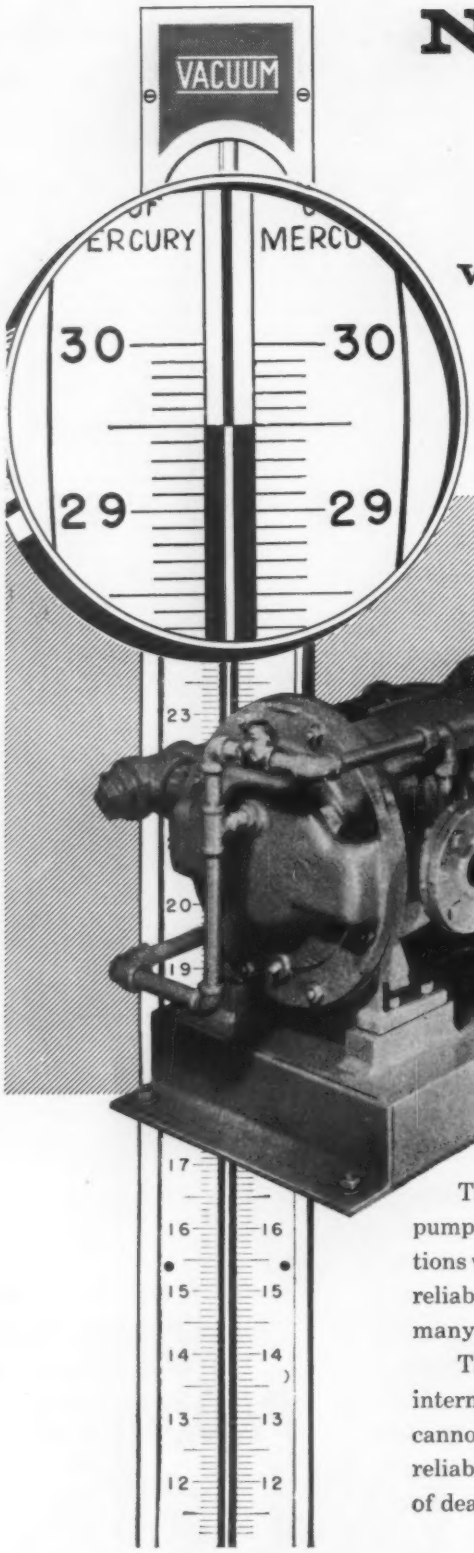
*sugars, starches and syrups from*

**CORN PRODUCTS**

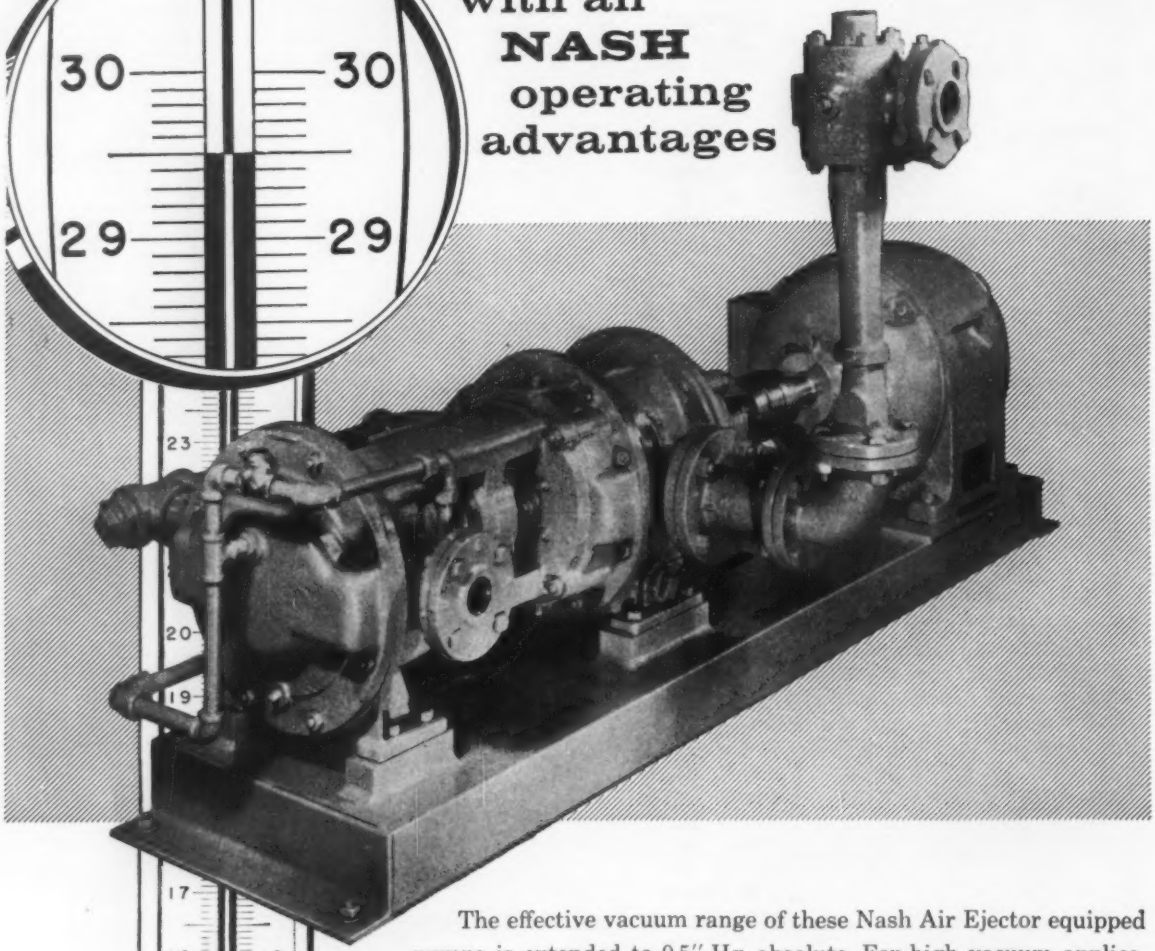
**WRITE OR PHONE** *Corn Products for expert technical assistance...*
*helpful data on these fine products for the Food Industry:*
**CERELOSE® dextrose sugar · REX® and GLOBE® corn syrups · BUFFALO® · HUDSON RIVER® and SNOWFLAKE® starches.**

**CORN PRODUCTS DIVISION** CORN PRODUCTS SALES COMPANY · 9 East 55 Street, New York 22, N. Y.

# NASH PUMPS for higher Vacuums




## with all NASH operating advantages



The effective vacuum range of these Nash Air Ejector equipped pumps is extended to 0.5″ Hg. absolute. For high vacuum applications where hard to handle service conditions are present and where reliability of pump operation is imperative. These pumps can handle many saturated or wet gases including solvent and acid vapors.

These pumps have but one internal moving part, and use no internal lubrication. The vacuum produced is non-pulsating. They cannot be damaged by a slug of liquid, and will provide the same reliability and long life even if the operating cycle consists mostly of dead end service. Please request Bulletin 387-A.

## NASH ENGINEERING COMPANY

SOUTH NORWALK, CONNECTICUT, U. S. A.

## Larrick Has More Authority

Secretary Flemming has delegated more authority to FDA Commissioner George P. Larrick in an attempt to speed up decisions on food and drug problems. The Commissioner is now empowered to sign final orders on regulations for which hearings have been held.

This means the Secretary will not personally have to study the problem and sign the order.

The new lower-echelon approval could speed such regulations as the ice cream standards.

## Minimum Wage Hits Canners

The minimum wage bill expected to emerge from Congress had taken definite shape as FE went to press. If the bill cleared the necessary hurdles, which appeared likely, it would hike the minimum from $1 to $1.25 over 3 years.

It represents the biggest thrust for minimum wages since the Wage-Hour Law was passed in 1938.

All food chains will be covered but not most independents ($1 million a year gross is the break point.)

Canners could lose some of their exemption from paying overtime. They have been exempt on a seasonal basis—up to 14 weeks of total exemption, and another 14 weeks exempt up to 56 hours a week.

The Senate Committee cut this from 14 to 10 weeks in each case. The House Committee left it alone. But industry did not strenuously oppose cutting the exemption.

## Color Legislation Gets Action

The color additives bill has moved rapidly toward enactment. Only an unexpected development could stop it. The only substantial item of difference between the Senate and House bills is that the House Committee attached a Delaney anti-cancer amendment, which the Administration supports.

Industry has opposed the amendment, which flatly bans any cancer-causing agent, in favor of letting a scientific panel judge each case on its merits. But industry resigned itself to accepting the Delaney amendment in order to get a bill at all. The simple fact is that no Congressman wants to vote for a bill that isn't 100 percent "against cancer."

The Bill would permit FDA to set tolerances for use of small amounts of food and cosmetic colorings that under present law would have to be banned entirely because they are not completely "harmless" in the legal sense of the word. This could permit continued use, for instance, of Citrus Red No. 2 on oranges.

As with food additives, color manufacturers will have to conduct extensive tests and submit proof that their products are safe. Industry officials live in fear that extensive tests may turn up some minute trace of a carcinogen.

## "Rule of Reason" Gets Support

Support for substituting a "rule of reason" for the uncompromising Delaney cancer ban has come from an important group. It is a special committee of scientists appointed by Gov. Gaylord Nelson of Wisconsin to study the health hazard of chemicals in food.

The committee says the Delaney amendment "fails to take into account that many chemicals may be hazardous in large quantities and under conditions of unusually long exposure, but harmless under ordinary circumstances." It points out that even salt can cause cancer if injected under the skin for long periods.

The committee recommends less rigid regulation if a safe level of use for a carcinogen can be established by qualified scientists.

On the whole, the committee finds that "high standards of quality and safety are being observed by the nation's food producers." It adds that recent Federal legislation provides an adequate framework for protecting the public, although it does recommend better facilities for inspection and testing.

## No Cranberry Scare With Wheat

There will not be another cranberry-type scare with wheat. That's the assurance Secretary Flemming has given Congressional leaders.

Some farmers became alarmed when a Kansas City FDA official hinted some wheat crops might be seized if they are found to contain residues of the chemical weed killer 2,4-D. Actually, no residues have been found. But Flemming says if residues are found he is "sure" FDA will be able to set tolerances, just as it does for residues on apples, pears, citrus, quinces and asparagus.

## Bill Favors Overseas Profits

Some food companies will receive a tax cut on overseas profits if a bill passed by both Senate and House becomes law, which is likely. Only two items of difference remain to be ironed out in conference.

The bill will let a company treat all overseas plants as one unit for tax purposes, averaging out high taxes in one country against low taxes in another. Firms with plants in more than one country stand to benefit. It will cost the Treasury $15 to $20 million.

One of the companies testifying in favor was Coca-Cola. Heinz and Borden were cited in testimony as companies planning expansions overseas.

Sen. William Proxmire led the unsuccessful Senate fight against the bill as a "tax loophole" which would encourage "exporting U. S. jobs."

## Coffee Kept Under Control

Coffee producers in South America and Africa have extended for another year their pact curbing production and exports. It continues previous quota formulas and probably means coffee prices will hold at present prices. There is talk that the move might spread, which would mean a tighter control on world production.

## FTC Issues R-P Guides

Guides to what kind of advertising allowances and other merchandising payments are permissible under the Robinson-Patman Act have been published by the Federal Trade Commission. The 10-page pamphlet can be obtained from FTC's Office of Public Information.

# MEET TODAY'S HIGHER

# PURITY STANDARDS WITH DICALITE FILTERAIDS

## DICALITE OFFERS NEW CUSTOMIZED FILTERAID SERVICE

Today, standards of purity are tightening in every field—and tomorrow's will be higher still. But you can confidently meet both with the high-efficiency filteraids which Dicalite is producing right now.

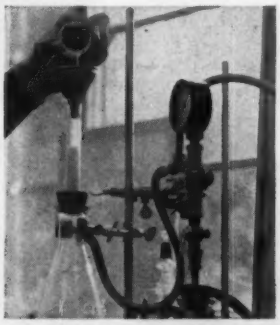
Today, with new processing advances made through continuing research, Dicalite can custom-engineer a filteraid made to precisely match your individual purity problem.

If your filtration must be so sharp that it removes particles too small to be seen with the optical microscope, a Dicalite Filteraid can do it. Or, if fast flow rates and increased production are your need, Dicalite can help you achieve that.

Your Dicalite man will be glad to advise with you on any filtration problem and help you determine if a customized filteraid will advance your processing.

Careful strata selection provides the best crude for each filteraid's final requirements.

New processing refinements, including special calcining methods, control filteraid characteristics with an accuracy never before possible in any plant.



With more than 22,000 quality control tests every month, the Dicalite plant laboratories hold every filteraid grade to rigid specifications.

New automatically-controlled packing and pressure-palletizing is the final step in efficient modern operation.

Dicalite®

Dicalite Department
Great Lakes Carbon Corporation
*612 So. Flower Street, Los Angeles 17, Calif.*

FE-2

The product I am filtering is _____

Have Dicalite man phone for appointment ☐ Send Information ☐

NAME _____

TITLE _____

COMPANY _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

## Plastic Trays Provide Protection and Appeal

Marked sales increases are cited for two products as a result of plastic tray packaging.

Schulze & Burch Biscuit Co., Chicago, is using the custom-formed tray for Flavor Kist chocolate peppermint cookies. Polyvinyl Chloride (PVC) has 12 "cradles" which hold cookies on edge instead of in customary flat position.

Individual support is claimed to protect products from crumbling and colliding. In addition, tray can be removed from the box and used as a serving dish.

Substantial labor savings through faster packing is also reported. One-piece "Panta-Pak" tray replaces multitude of individual paper packings.

Similar "Panta-Pak" tray is in use at the Chocolate House, Inc., Milwaukee, for packaging Marshmallow Eggs.

Overall container has 6 trays holding 6 candies each. Eggs are cradled apart, preventing damage.

Candy package also provides extra eye appeal in rich purple and gold colors. Attractive "bunny" illustration adds to "tender, fluffy" image of the marshmallows.

Introduced to the food industry over a year ago, Panta-Pak trays had previously been primarily used in the fresh fruit field. Supplier is Pantasote Co., N. Y. C.

Circle 401 on Reader Service Card

### Table Use Decanters for Vinegars

Gourmet cooking popularity has prompted H. J. Heinz Co. to re-style packaging of three present vinegar products and add a fourth.

Firm's malt, tarragon, and salad vinegars, plus a new wine item, are now available in 12-oz. glass decanters designed for table use. New labels, Cello-Seal tops, and removable shakers are among new features.

Attached to each decanter is a specially-prepared gourmet recipe brochure.

While available last June, intensive advertising is under way this month. New packaging is expected to spur an already active consumer interest in gourmet and Continental-type foods.

### 'Lumpless' Sugar with Poly Bags

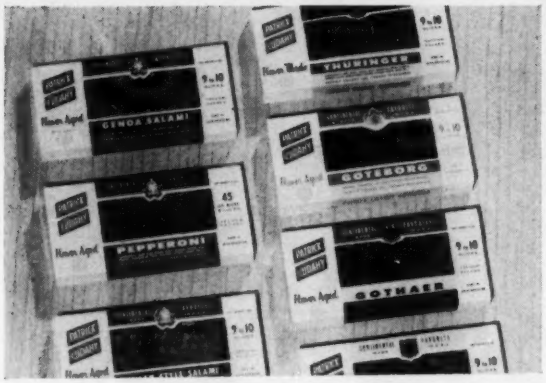
Attractive and durable 3-mil polyethylene bags are being used to package powdered and brown sugar by California & Hawaiian Sugar Refining Corp., San Francisco.

Important feature is bag's moisture barrier which minimizes product "lumping" and "caking." Poly material keeps air out of powdered sugar, and locks moisture in brown sugar to insure freshness.

Packages are easily molded to fit kitchen canisters, and may be effectively reclosed with plastic device being used to promote the products.

Bags are flexographically-printed in three colors and contain 2½ lb. of sugar. Supplier is The Dobeckmun Co., Cleveland.

Circle 402 on Reader Service Card




## Continental Foods from Cudahy

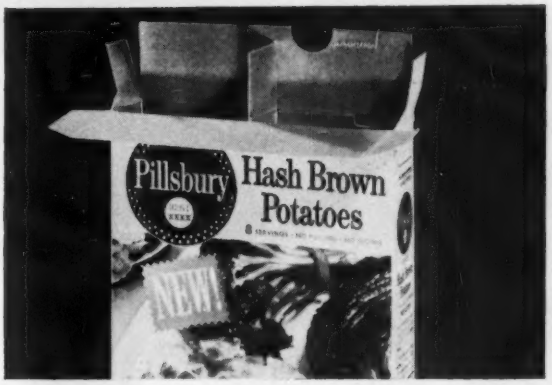
Trend to marketing overseas-type foods is joined by Patrick Cudahy Co. with seven new continental items.

In national distribution from Cudahy are: Genoa Salami, Pepperoni, and Milan style Salami from Italy; Goteborg from Sweden; and Thuringer, Gothaer, and Hard Salami from Germany.

Vacuum packed pouches of product are visible through large-size windows in each carton. Designs include prominent Patrick Cudahy trademark, "Continental Favorite" copy, and national coat of arms.

Attractive Glamakote packages are from Marathon.

Circle 403 on Reader Service Card




## Divider Carton for Instant Potatoes

Compartmented carton used for Pillsbury Instant Mashed and Quick Hash Brown potatoes is divided in center to allow half-contents use for one serving, with the balance protected for later needs.

Lining is two sheets of amber Glassine wax-laminated together and to paperboard. Combination is claimed to protect dehydrated potatoes from moisture. Calk-Seal process provides a damage-proof seal of permanently pliable, non-tainting material.

Cartons are lithographed with appetizing illustrations of product in use. Each contains 8 servings. Packaging Corp. of America is carton supplier.

Circle 404 on Reader Service Card

## High Transparency for "Window" Film

Trycite, thin polystyrene film developed by The Dow Chemical Co., is now in use as a window cover for Martha Monroe's Fudge 'n Nut Brownies.

About 15 mil thick, cover has extremely high transparency for extra visual appeal and product recognition.

Added feature is diversified low cost of the molding material. Presently priced at 60¢/lb., film yields 25,400 sq. in./lb. for 1 mil thickness.

Material has previously been used in the folding carton industry. Meat packers have used Trycite widely in bacon cartons and candy producers have found it useful in window packages.

Circle 405 on Reader Service Card

## Designed for Appetite Appeal

Design emphasis is on the Italian style and flavor of new frozen Shrimp Italiano from Excelsior Food Products, Inc., Long Island City, N. Y.

Highlight is an appetizing photograph of the shrimp entree in ready-to-eat form. Background features fresh fruit bowl, a pepper mill, and a glass of red wine—all typical Italian meal accessories.

Construction features include a special side-lock closure, with full end panels for identification, and a secure lock. Though easy to open, lock withstands normal handling and resists pilferage.

Carton, which contains a "boil-in-foil" pouch, is made and printed by Lord Baltimore Press.

Circle 406 on Reader Service Card

*Localized Steel Service Centers can fulfill your steel requirements and eliminate the necessity for inplant inventory, thus releasing your investment in raw material and increasing your working capital.

Don't take chances trying to outguess supply and demand. Adequate stocks are maintained in a wide range of types, shapes and sizes. Delivery is *immediate*.

MICROROLD STAINLESS STEEL is regularly carried in stock by many of these independent steel warehouses. Washington Steel is a producer of stainless sheet and strip exclusively, all of which is precision rolled on Sendzimir mills.

WASHINGTON STEEL CORPORATION

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**INSTANT LEMONADE** is new convenience item from ReaLemon-Puritan Co., Chicago. Five parts water can be added to the concentrate, which is aimed at a record sales market.

## New Product Shorts

**Noodle With Chicken** is third product in Kraft Foods' dinner line.

**Knott's Berry Farm Boysenberry Juice** is being introduced into Chicago and Minneapolis markets this summer by The California Frozen Juice Co.

**Coffee-Flavored Soda** in 16 oz. bottle size is being test-marketed in Northeastern states by Cott Beverage Corp., New Haven.

**Spiced Pear Gelatin Salad** has been added to Borden Foods' line of molded salads and desserts.

**Gravy Magic,** flour substitute claimed to prevent lumps, is being tested in six cities by General Mills.

## Packaging Briefs

**Ultrasonic Method** joins polyester sheet, film, and tape, without need of joint preparation, external heat, or adhesives. Low cost process, applicable to variety of films, was developed by International Ultrasonics, Inc., Rahway, N. J. (407)

**Patapar Vegetable Parchment 27-110T** is said to retard spoilage and extend shelf life of foods. Wrapper is first mold-inhibiting packaging material approved by FDA, and can be readily printed and glued. (408)

**Birds Eye** potato products are now in completely redesigned red packages for greater visibility and drawing power.

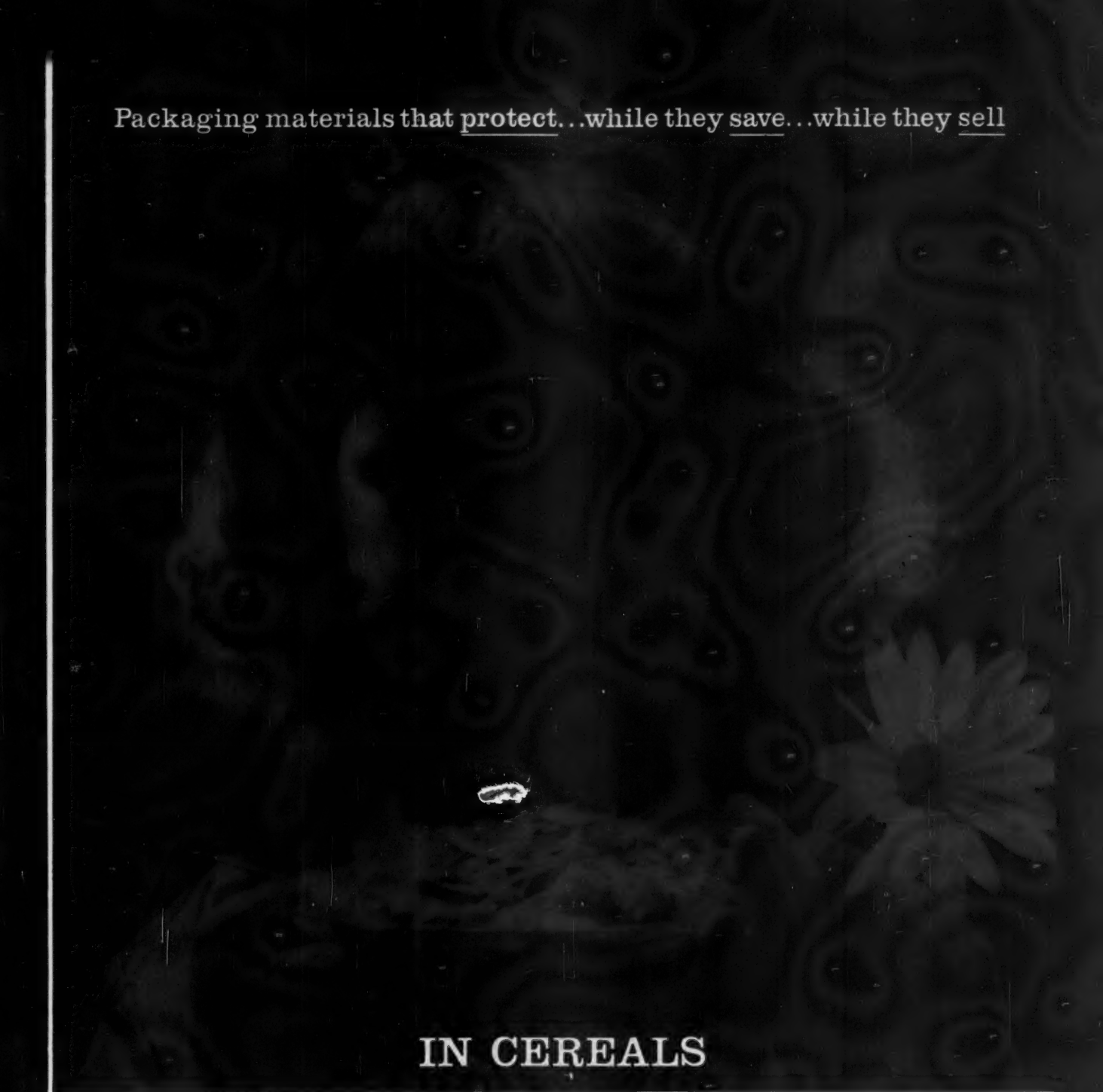
**King Size Coca Cola** in 12 oz. bottles are now available in New York area.

**Vertical Curl Container** for frozen food entrees and casseroles has been announced by Ecko-Alcoa. (409)


CIRCLE 30 ON READER SERVICE CARD

CIRCLE 31 ON READER SERVICE CARD ➔

Packaging materials that protect...while they save...while they sell



# IN CEREALS

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Six of the seven largest cereal manufacturers use Riegel packaging materials regularly. They buy Riegel because long personal experience has given them faith in Riegel's technical leadership and Riegel's ability to tailor-make the right paper for the product. This confidence, demonstrated by sales leaders in *many* fields, is an important reason why you too should talk to Riegel.

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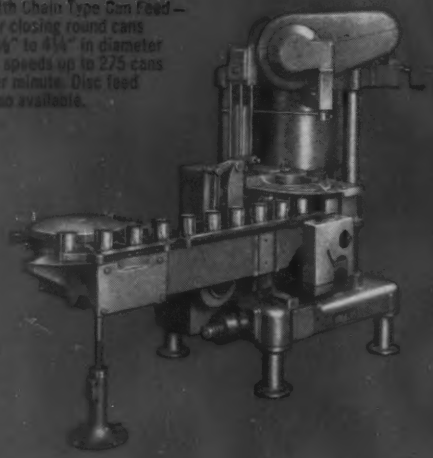
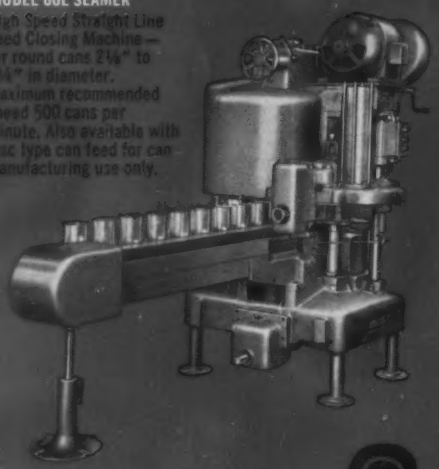
# *Which* ANGELUS CAN CLOSER *for you?*

**MODEL 40P-MSLF SEAMER**
With Chain Type Can Feed — for closing round cans 2⅛" to 4¼" in diameter at speeds up to 275 cans per minute. Disc feed also available.

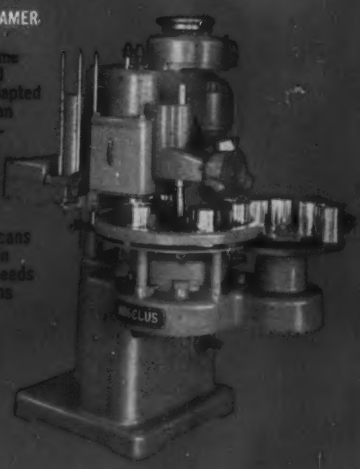


**MODEL 50P SEAMER**
With Disc Type Can Feed — for making or closing round cans 5" to 6¾" in diameter at speeds up to 150 cans per minute.

**MODEL 60L SEAMER**
High Speed Straight Line Feed Closing Machine — for round cans 2⅛" to 4¼" in diameter. Maximum recommended speed 500 cans per minute. Also available with disc type can feed for can manufacturing use only.



**MODEL 10P SEAMER**
Designed for moderate volume production and particularly adapted for frequent can size changes — adjustable for closing round cans 2⅛" to 4¼" in diameter at speeds of 30 to 85 cans per minute.



These are a few of the many Angelus Seamers designed to meet all round can closing requirements. Angelus, with over 45 years of specialized experience, is the nation's only manufacturer exclusively producing automatic round can closing machines.

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# What New FE Ownership Means to You

Whether you have been reading FOOD ENGINEERING for two years, or thirty-two, you will appreciate that it does more than keep pace with progress.

In the interests of you, the reader, FE has kept changing *ahead* of the times. It does more than provide prime information about current trends. FE anticipates your needs in advance, as only a leading publication can.

In the decade following its 1928 birth, the magazine FOOD INDUSTRIES served a new era of scientific development with consistent editorial emphasis on technology. After World War II, when you were gearing to meet consumer demands with more efficient production, we became FOOD ENGINEERING.

**FE serves changing needs**

Then the balance shifted to a buyers' market, and product impact at point-of-purchase was paramount. So FE gave you plenty of packaging know-how.

Still more recently—as pointed up by Robert J. Keith, vice-president and director of the Pillsbury Company—food leaders have acknowledged the existence of a marketing revolution.

FE was ahead of this, too. It oriented the industry in respect to the trend a decade ago, and added "marketing" to its slogan in 1957.

Now your magazine takes a new step to help readers and advertisers toward "better management in manufacturing, packaging, marketing." With this issue of July, 1960, we become officially "A Chilton Publication."

The thirty-two year leadership of FOOD ENGINEERING will be jealously guarded and further stimulated by association with the Chilton Company.

Throughout half a century of business paper publishing, Chilton has maintained an award-winning record of editorial excellence and integrity. And its new Marketing Assistance Program places Chilton in the vanguard of America's most enlightened publishers.

**Will lead under new banner**

Under the Chilton banner, FE will maintain its editorial leadership of the industry. It will criticize poor practices, commend enlightened ones and point the way to faster progress. It also will defend the industry against unjust attacks, and will throw the spotlight on unsound or damaging regulations and legislation.

Editorial coverage of manufacturing, engineering, packaging, marketing and management methods will be continued. With this formula, the multiple interests of men in the great, complex, fast-changing field of food manufacturing and processing will be served.

Significantly, too, FE will do more than publish editorial information about new ideas, methods, facilities, and trends in the various phases of food manufacturing. It will interpret the significance of advances in terms of the total manufacturing operation.

Key men in food manufacturing companies must be alert to the overall needs of the business of which they are a part. Only then can they contribute in the fullest to the success of that business. FE will keep them alert.

This is editorial policy and practice. It is tailored to fit the shape of the industry and the needs and interests of the men in it.

**Grahame E. Riddell, Publisher**

**Frank K. Lawler, Editor**

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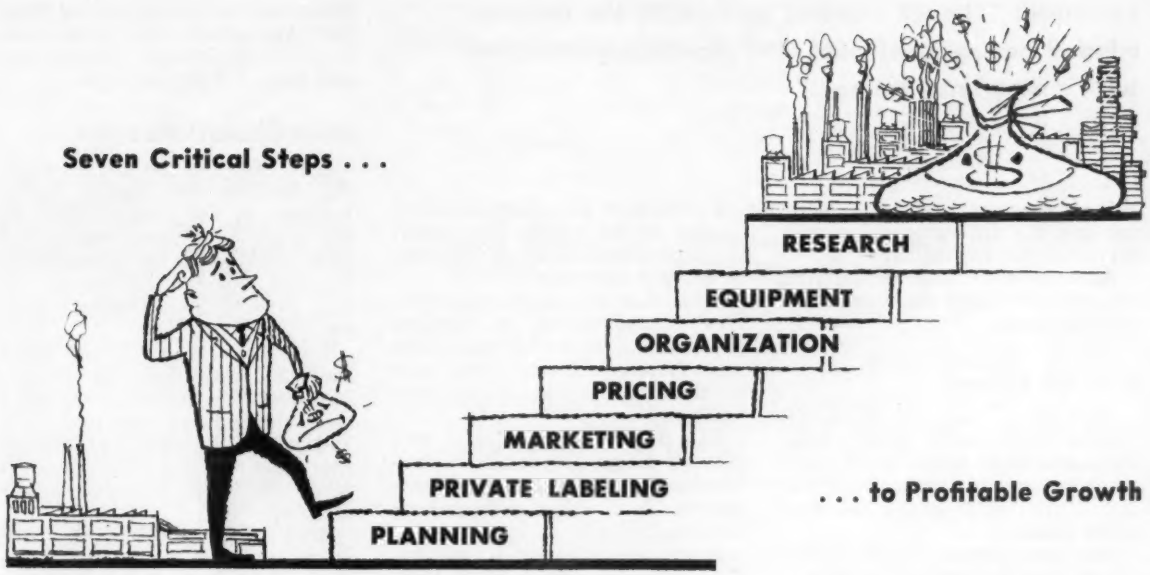



FOOD ENGINEERING

# Keys to Small Company Success

**Here's how one little firm struggled with problems in big business world . . . Its decisions—right and wrong—will help you to steer your course to profitable expansion**

HOW'S BUSINESS? Small business, that is.

If it's not doing so well, management should take heed of seven common factors that will mean success or failure in its industrial future. They are: Planning, Private Labeling, Marketing, Pricing, Organization, Equipment, and Research.

**Managed correctly, they'll bring cost reductions and higher profits.**

Of course, each company has its own problems and policies. But here's an opportunity to see how "the other fellow" did it by studying the ups and downs in a typical firm's history of growth. Its moves—some good, some bad, and some lucky—will help the small business operator to decide his strategy as it relates to our seven key signposts.

The XYZ Food Co. (real name necessarily omitted) opened shop to manufacture "home-type" egg noodles. Three years later, it owed creditors more than double an original $3,000 investment.

Why? Principal reasons were:

1. Large-volume wholesaler and distributor outlets were overlooked in favor of small retailers. Thus, volume couldn't even meet sales and delivery expenses.

2. Selling price was based solely on small volume instead of figuring maximum production potential, and basing price at the lower manufacturing expenditure.

3. Company officers drew large salaries even though experiencing losses, and refused to plow money back into business expansion.

To meet short-term commitments and stave off receivership, XYZ hired a top flight sales manager. He immediately attained a year's extension on debts and began calling on the largest retail outlets, wholesale distributors, and wagon jobbers in the area. Various deals were offered, including quantity discounts, higher profit margins, free case for every ten, and cooperative newspaper advertising.

To compete with national brands, selling price was adjusted to conform with lowest unit cost for producing noodles. In addi-

**FRED ZIMAN**
Manager of Research, Product Development, and Quality Control, Wm. Barnes, Inc., Minneapolis

**Principle: "Though starting out small, the growth-minded management must soon plan its expenditures with a long-term outlook."**

tion, management salaries were cut and the difference reinvested into business expansion.

As a result of these moves, firm was able to meet its short-term commitments.

## A Helping Hand

XYZ got a chance to diversify production when a large chain store offered to invest some capital in equipment for the manufacture of its line of mayonnaise and salad dressing.

The firm accepted and moved into a larger plant. It could now stabilize production and employment, as well as spread overhead costs. Mayonnaise and dressing could bolster the summer production lag caused by the primarily winter-selling noodles.

Important economies resulted. Cost of manufacturing products dropped 12.5% in 5 yr. Executive salaries decreased from 7.2% of sales to 5.2% in 3 yr. These savings permitted expansion into private-label production.

But the business was operating on a poor current asset-to-liability ratio—with little cash on hand for short-term payables. "Normal" ratio is about 1.75:1.

Then, tough competition forced XYZ to drop noodle production. It was unable to afford modern equipment because it produced only one macaroni product, egg noodles. So the firm could not beat nationals who were turning out higher quality, lower priced products.

Management then decided to produce high-quality dressings at relatively high prices. Chains, wholesalers, wagon jobbers, and distributors, working on a low profit margin, were offered almost double their take on national brands. Deals and discounts sweetened the dealers' pie even further.

## Stabilization Lost

XYZ also introduced dressings under three company labels—for restaurants, a v e r a g e shopper (high quality brand), and "discriminating consumer" (top quality brand).

Profits were high for a time, but demise of the noodle line meant slack production periods and loss of efficient personnel.

XYZ then decided to manufacture peanut butter to stabilize production. Lack of a top quality manufacturer in the area also prompted officials to add the new product.

But no food technologist was enlisted to guide product formulation, so much of the year's production was either scrapped or reworked.

Result was a business nosedive. Cost of goods sold rose 19%. Dressing quality also dropped and sales plummeted $100,000 in 3 yr.

In an effort to salvage the firm, the original owner bought out his partner, who had been supervising plant operations. However, he mistakenly elevated the plant mechanic to plant manager. Also lacking technical efficiency, as well as supervisory ability, the new manager continued with the same old trial-and-error approach.

## S.O.S. for Technologist

To recoup efficiency and quality, the president finally hired a food technologist. He immediately set up specifications on raw materials and supplies, as well as a plant sanitation program. Despite insufficient funds allocated for lab facilities, the technologist brought a quick dollar return.

Immediate benefit was product savings through correction of excessive overfill. In mayonnaise and dressing jars, for example, the firm was losing 1.5-oz./jar. Since 15,000 jars were filled per day, the loss was substantial.

Then the rate of ingredient flow into product was checked. Vibratory feeders proved to be out of timing, with ingredient additions over and under. Corrective studies were made, too, of roasting, grinding, and cooling.

Suggested improvements were met with cost questions by management. Instead of constructing a guaranteed installation for $12,000, XYZ had its own mechanics build an inefficient cooler for $8,000. After 18 mo., product quality was down because of improper air velocities, cooling time, etc. An outside firm then constructed an inferior cooler that had to be rebuilt each year.

## More Chain Dollars

XYZ then bid for and clinched the dressing and peanut butter business of the largest chain in the area. Sale price was based only slightly above manufacturing cost, but enough was left to take care of some overhead burden.

New business fit in well since the plant was operating at only 55% capacity. But risks included maintaining large inventory stock and being subjected to squeeze by the chain when a competitor offered to work on even closer margin.

XYZ then increased the risk when it took on two bad practices —speculative buying and low quality production. Management took the attitude that a low price structure meant that price is the prime motivating factor, with uniformity of quality and brand name secondary. It also felt that price could be raised after low margin had gotten it the business, and after product's quality and sales appeal had been accepted.

XYZ thinking backfired, however, when the chain switched to another supplier on short notice.

Finally, XYZ, with 10 items, merged with a small cheese firm handling 12 more. It put its own trucks on the road as wagon jobbers selling direct to retailers. Advantages were:

**1. Closer consumer contact at retail level.**

**2. More familiarity with retailers' problems.**

**3. Better servicing of retailers and stock rotation.**

Moreover, the firm didn't have to depend on wholesale distributors to push items through channels.

## Let's Look Back

We have seen, in highlight fashion, how one small company struggled for success. Now let's analyze its problems in terms of our seven signposts of business strategy. First:

**PLANNING.** XYZ grew, not from long-range planning, but luckily through a series of short-range decisions. Factors other than management's foresight contributed to firm's growth.

On the other hand, close-to-the-vest financing saved it from pos-

sible bankruptcy. As a rule, when a small firm starts out with limited capital, fixed assets should be kept to a minimum until volume is achieved.

**But a growth-minded management must soon plan its major capital expenditures with a long-term outlook.**

Financing these expenditures should be based on sound investments in equipment that won't be obsolete in 5-10 yr. If this long-range surety isn't possible, the company's equipment-purchasing plan should be flexible enough to include additional facilities as needed.

Despite an approximate 600% sales increase during a 20-yr. period, XYZ's plant facilities remained relatively static and operations inefficient.

Too big a load fell on obsolete equipment. XYZ would have been wiser to purchase better equipment and strengthen its supervisory personnel, allowing fixed assets to expand with sales growth.

From a long-range viewpoint, it's not wise to defer replacements beyond a certain time. If this is done, the plant won't operate economically and profits for any given period will be overstated due to low depreciation rates.

**PRIVATE LABELS.** Attracting business through private labeling put XYZ in a lopsided marketing position. At one time, 70% of its business represented private labels. (See Table I.)

Important to any business is making an early decision on whether to: (1) Promote only its own brands, (2) Pack only under private labels, or (3) Sell both its own and other labels.

Due to limited finances, most small firms aren't in a position to push their own brands. So they may be forced into private labeling to secure sales volume, utilize the plant more efficiently, and avoid heavy promotional costs.

**But, when more than 50% of its production is in private PLs, and more business necessitates expansion of facilities, a firm should carefully consider the long-range advantages of building its own brand against the short-term economies of private labeling.**

**MARKETING.** A food company's most critical problem is building a preference for its own brand-labeled products.

**And the only way for the little fellow to create this demand is to operate at retail levels and promote point-of-sales advertising to the hilt.**

It might also help to manufacture a high-quality product at a higher selling price and profit margin. Selling directly to retailers through company wagon jobbers would be better than servicing wholesale distributors.

Management might consider running promotional campaigns in small communities, as the cost wouldn't be prohibitive. Moreover, marketing statistics would be invaluable for future promotions.

Service to chain stores should continue only as long as increment costs don't exceed benefits derived from spreading overhead.

**PRICING.** Just how much should a small company cut prices when its handling highly competitive products?

Here, it must make up its mind whether the apparent short-run advantages of cutting prices to meet the many special situations are likely to turn into long-run benefits or disadvantages.

**ORGANIZATION.** It's wrong for small business to take the attitude that it doesn't have the funds for research or a capable management team. Once a firm has realized profits, it must allot a portion to strengthen these essential elements of future success.

At XYZ, the organizational setup isn't too sound. The company's head has been president, vice-president, treasurer, purchasing agent, and sales manager. As such, he has been the backbone of the business, carrying it along through his personality, persuasiveness, and personal contacts.

Only by building a capable executive group could it function with authority within a definite line of decision. Needed, too, is the creation of a more harmonious atmosphere within the company. Helpful would be an employee bonus plan.

**EQUIPMENT.** Common with small business is an unwillingness to replace obsolete facilities. Instead, it continues using them (when already written off the books) although they contribute to high production costs.

For example, when XYZ's salad dressing department expanded, a more efficient method was sought to cool the starch-vinegar slurry. The old method took about 30 min. and held up production about 8 min. every hour.

Management had two choices: (1) Purchase a $10,000 mixer-type heat-exchanger that would cook and cool within 30 sec., or (2) Buy a $1,500 heat-exchanger which, in two steps, brought slurry temperature down to 85F. in about 15 min.

Unfortunately, XYZ bought the lower-cost unit unsuitable for the job, difficult to clean, and hard to operate.

**RESEARCH.** XYZ wisely hired a food technologist to improve quality and make operations more efficient. Unfortunately, management would not purchase adequate lab facilities, as well as processing equipment.

If a small food company like XYZ is to effectively cope with the seven signposts of business growth, it is obvious that an enlightened, educated management must be at the helm. (End)

**Too Much Emphasis on Private Labels**

| Product | Company (Quart Cases) | Private (Quart Cases) | % Company |
|---|---|---|---|
| Salad Dressing | 26,607 | 41,384 | 39 |
| Sandwich Spread | 200 | 1,125 | 15 |
| Mayonnaise | 1,000 | 19,169 | 5 |
| French Dressing | 50 | 662 | 7 |
| Roquefort | 660 | None | 100 |
| Peanut Butter | 7,500 | 22,500 | 25 |
| | 36,017=30% | 84,835=70% | |

TABLE I—LOPSIDED RATIO of company vs. private labels indicates XYZ is in a dangerous marketing position. About 75% of peanut butter volume is being sold to chains at less than total cost.

*FE Outlook Report:*

# First-Half Surge To Carry Over

**Chief execs look for 4% volume gain in last 6 months of '60. . . . Also 4% profit improvement over '59**

SALES during the last 6 mos. of '60 will continue on the upbeat, according to food company presidents polled by FE. The chief executives look for a 4% rise over first-half levels, and point to these key factors (which you should include in your forward planning):

▸ Rising personal income, heftier consumer outlays (sparked by new products), better balanced inventories (with less need for distress selling), sharp snap-back in the institutional market, improved operating efficiency, and stepped-up marketing budgets (see chart for '60 figures).

Shaping the presidents' optimism is a strong first-half performance by this industry. While business in general trended sideways, food and beverage manufacturers pushed their volume up a spanking 5.8%.

If you add to this the looked-for 4% gain, it's possible that food firms will close the books at year-end with $57.8-billion in sales. This would be an impressive 5.6% gain over '59.

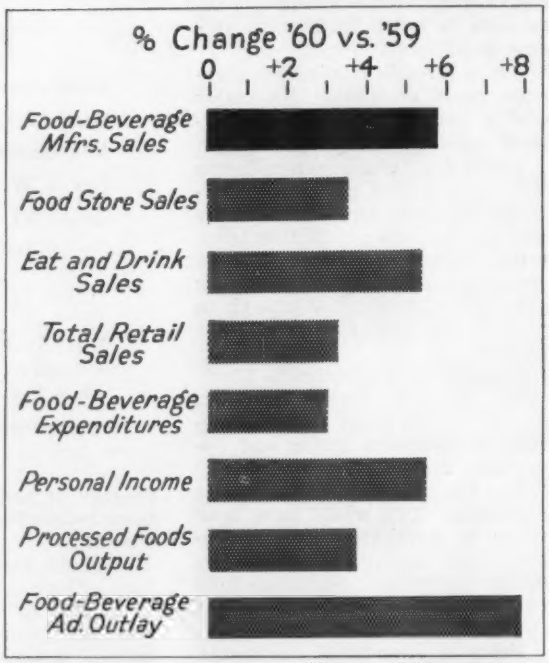
## What They Said

Along with greater sales, food firms expect to brighten their profits this year—by some 4.4%, they told FE. Helping out will be anticipated 4.7% rise in tonnage, and greater capital expenditures (up 13%, according to Commerce Dept. estimates).

**Overall optimism was summed up thusly by a leading canner: "We're going into the new pack with a well-balanced inventory that should eliminate some of the distress selling of the past 4 or 5 yr. If disposable income continues on a high level, as indicated by defense spending, we should have a good year on volume and margins."**

A soft drink firm, looking for 20% fatter profits, is banking on a "better organizational structure and marketing plan."

**Food Uptrend Gains Momentum**




**KEY INDICATORS** show quick pace that's being set this year. Figures are for same periods in '59 and '60. The 5.8% gain in manufacturers' sales, and 8% bigger outlay for advertising, jibe closely with FE's forecast in January (for 5.5% gain in sales, 9% in advertising).

"Elimination of low-profit business" makes an Eastern baker feel he'll up his net 25%, his sales 10%. And a Midwest outfit anticipates 15% more volume this year on the basis of "a better supply and demand picture."

A premium-price specialty concern expects to hike sales 5% on the strength of "larger consumer disposable income." Trends to date may be strong enough to bar the usual year-end fall-off, says a packaged goods concern that figures to boost sales and net 7%.

Of course, not all agree with this kind of confidence. A grain mill executive, moaning over higher transportation costs, expects a 10% decline. And a juice concentrator fears his profits will be slashed in half. A dairy outfit is "less confident than we were at the first of the year since the boom hasn't been as big as was originally expected." But, he reasons, this "may be a good sign for '61."

**On the whole, though, four-fifths of the presidents expect their companies to do better in the last 6 months. As for final '60 results, 75% of the chief execs anticipate higher sales, 62% brighter profits.**

The issue that found chief execs most evenly divided was prices. Some 40% see no change from present levels for the balance of the year, while an equal number plan to raise prices to offset added costs.

So far this year, food makers have held the line in this area. For the first 5 months, retail prices averaged a shade lower than in '59 period, while wholesale prices downtrended 1%.—(End.)

**THAYER C. TAYLOR**
Associate Editor, "Food Engineering"

TO HIS FRONT and to his right are key company personnel with whom process engineer must maintain efficient liaison. He must fit smoothly into the company lineup.

# Just WHAT Is the Job of the Process Engineer?

**A foremost practitioner gives you working dissection of post that is proving vital in battle for top-efficient operations . . . Pinpoints 14 areas of responsibility and 6 areas of liaison . . . Prime tips on where, why, how, and who**

THE QUESTION heading this article is asked with such astounding frequency—and by such responsible persons—that it's high time we get closer focus on—

**▸ 1. The realm of the process engineer, and**

**▸ 2. The ways in which to organize and utilize his operations to accomplish the pertinent objectives.**

Let's first lead up to the realm:

Reasons for lack of comprehension relative to this post aren't too difficult to find when we realize that the food industry has been revolutionized in the past decade by consumer demand for new products and convenience foods.

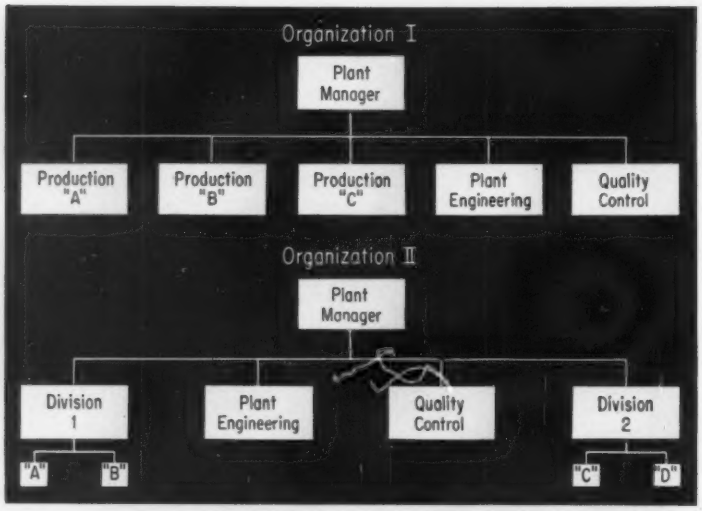
Technology has opened the door to new processes and new equipment—and at such a rate that an influx of technically trained personnel into food plants has been a necessity. Augmentation of existing plant engineering, quality control, and R&D sections has been a natural requirement.

The point is, however, that the backbone of the food industry is still the production man. And it is the production department where Q.C. standards are maintained, unit cost controlled, and personnel problems dealt with.

Furthermore, the high rate of technological advances has posed a number of problems for the production department—problems with which these personnel have neither the time nor training to cope.

Result is that either the valuable experience of the production man has to be bypassed and old mistakes repeated, or technical assistance must be furnished to enable the production department to

**R. J. PIETTE**
Process Engineer
Thos. J. Lipton, Inc., Albion, N. Y.




**WAY YOU'RE ORGANIZED determines responsibilities and lines of authority. In these examples of company systems, the P.E. would best report to department heads in Organization I, but to divisional heads in Organization II.**

make proper evaluations of proposals, draft recommendations for modifications or replacements, point out pitfalls and coordinate efforts toward a more profitable overall operation.

**This, then is the realm of the process engineer. In short, he's the staff technical assistant to the production department.**

However, factors make it impossible to describe his duties and responsibilities in terms of a package system—for since he's a staff member his areas of responsibility are determined by the line management organization, which varies considerably.

But we can detail the general range of duties that the process engineer should be capable of handling. And thus we can get a "fix" on the goal to guide organization and development of the process engineering section.

## To Whom Does He Report?

Regardless of the titles used or organizational framework of line management, there are these criteria for determining to whom the process engineer reports:

His superior should have sufficient authority and responsibility to insure being consulted and his views respected on all matters affecting the manufacturing process, including capital expenditures and long-range planning.

And this superior should not be so far removed from the actual routines that he doesn't know the daily operating problems.

This poses a problem where, in some cases, there may be a split responsibility — with capital expenditure decisions and new-process discussions taking place on one level and routine production problems on another.

Take, for example, an organization where three dissimilar production units are operating under one roof with centralized plant engineer and Q.C. staffs (see Organization I in accompanying illustration). Here, it's logical to assume that the managers of Departments A, B, and C could each have decision-making responsibility at that level, and that therefore the process engineer would report to them.

But assume another setup (see Organization II) where divisional managers head the dissimilar operations of Department A, B, C, and D. Here, it's quite possible that while routine problems are handled at A, B, C, and D levels, the capital expenditures and planning decisions are formulated at divisional-manager levels. In this case, it's advisable that the process engineer report to a divisional manager and work on an assigned basis with Departments A, B, C, or D.

In general, the person to whom the process engineer reports should be at least on the same level or responsibility, authority, and stature as the heads of the technical service departments.

## Tools and Areas

The basic tools of the process engineer are information, records, and statistics—it being axiomatic that the more facts available for application to a problem, the more accurate the solution.

Therefore, it is essential that all cost and production figures, production rates and forecasts, and all related information, be made available to the process engineer. And at the earliest opportunity he should have at hand information regarding formulation, ingredient specifications, advanced research, and proposed new products.

Likewise, quality problems, consumer complaints, competitive product evaluation, and related items, should routinely be reported to him.

Also, long-range corporate planning and present company policy and goals should be sufficiently revealed to enable him to further those efforts.

The process engineer, as a staff member, has no line authority and no routine responsibilities, with the exception of periodic reports submitted to his superior.

Here, in general, are his areas of responsibility:

1. To develop and implement equipment installation or modification projects to reflect the best possible determination of engineering design, manpower and equipment requirements, with improved overall efficiency of production the goal. Also, to submit to the production manager realistic justification for monetary appropriations requested for such projects.

2. To furnish technical assistance to production personnel — with the aim of satisfactorily resolving non-routine operational process problems.

3. To develop and recommend processing-design or technique improvements that are justified by effect on cost, quality, service, and personnel.

4. To furnish sound technical advice to the production manager and maintain technical communications with headquarters engineering, R&D, and other headquarters and plant technical personnel to increase and utilize over-all company technical knowledge.

5. To coordinate work within the production area with other operating departments, as they are affected by these projects, to assure proper consideration of overall effect on plant operation.

## Spotlight on Benefits

**With the capable P.E. acting through a properly organized section, the greatest and most obvious reward is in overall teamwork.**

**Improved and detailed communications between departments win mutual understanding of problems. Potential difficulties are eliminated in the conference room or on the drawing board —rather than on the production floor.**

**Production schedules are drafted on realistic bases, and these schedules are met.**

**The number of crises are thus reduced, and additional time can be devoted to more efficient routine operation by all.**

**Particularly remember that production is the hub in the food processing plant. And the smoother the operations at this point, the smoother the operations at all other points.—R. J. P.**

6. See that specifications and product information furnished to production provides necessary information for establishing production processes, which in turn will result in the product meeting prescribed specifications. If such product specifications can't be met with economical use of facilities, he is to work with appropriate technical personnel to find a satisfactory solution to the problem.

7. Determine short- and long-range plans to increase efficiency of operations and to maintain production-area facilities, with effective communication of such needs to the production manager.

8. Develop process improvement plans and submit to production manager.

9. Develop project schedules that will result in work being performed at the most advantageous time for the company, with minimum disruptions of production.

10. To evaluate and establish standards of equipment and process reliability to result in minimum unit-cost of production.

11. To coordinate planning and project work with the industrial relations department to insure that proposed changes further the company's policies.

12. To insure that all present and future processes conform to the company's safety standards. When such standards are not being followed, he is to recommend proper corrective measures to the production manager.

13. Aggressively pursue cost-reduction opportunities in the production area and make sure that actual savings are realized wherever possible.

14. Keep abreast of the latest applicable engineering developments and see that those developments are considered for use, with facts communicated to appropriate technical personnel.

## Winning Coordination

This review of the functions and responsibilities of the process engineer may create the impression that there is a serious over-lapping of responsibilities with other technical service areas.

Such isn't the case if the various technical service departments and the production department have the authorities and responsibilities normally accepted as standard.

To clarify the relationship of the process engineer with other departments, let's discuss each of these areas:

**1. Quality Control:** Maintaining of company quality standards is the duty and responsibility of every employee of that company.

But the responsibility of the process engineer further includes aggressive efforts to investigate present accepted quality limitations and, if possible, to eliminate them and permit higher production quality.

It's also the responsibility of the process engineer to see that established quality standards are realistic from a production standpoint and do not impose unrealistic costs.

To accomplish such objectives, it's necessary that there be a mutual understanding of the problems involved.

One method: Have weekly or monthly quality meetings, with Q. C. staff members, production manager, and process engineer in attendance. Here, quality problems can be brought up and consumer complaints discussed by Q.C. personnel. In order, too, is a consideration of production problems related to quality, also proposed installations or modifications.

The process engineer should take every precaution to see that the quality control department is consulted and satisfied with design work concerning all new installations and process modifications. Approval of the Q.C. manager should be obtained on all final proposals.

The quality control department, on the other hand, should furnish copies of all ingredient specifications to the process engineer and consult with him concerning any deviation from these specifications or proposed changes.

Q.C. generally issues production formulas. However, these should be subject to approval by the process engineer and production manager. In this area alone substantial economies can be achieved through close cooperation—especially in batch operations by proper selection of weights and resulting efficient ingredient scaling and cycle times.

To the process engineer should be routed all quality-report summaries, and he should be notified immediately by quality control of all major quality problems.

**2. Plant Engineering:** Function of, and inter-relationship between, process engineer and plant engineer are often very confusing to the uninitiated.

But actually this should not pose any new problem. In fact, it is generally found that where plant engineering and process engineering units are properly organized, there is no greater cooperation and understanding of mutual problems than between these two.

The ideal process engineer is a "different breed of cat" from the ideal plant engineer.

Normally, the plant engineer is at his best with the actual basic engineering work of installation and modification. In contrast, the process engineer should have an aptitude more akin to that of a technically trained administrator. His work should complement the plant engineer's by resolving, during preliminary design stages, the various potential production problems and desires.

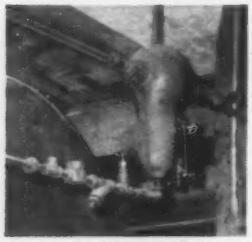
The actual detailing, specifying, and installation remain the sole responsibilities of the plant engineer. But the path can be made easier through prior approval of plans by production and other departments, plus follow-up, as may be necessary, on production scheduling to facilitate the installation.

The process engineer also should work with plant engineering to obtain from equipment-installation engineers the operating charac-

# SARCO TOPICS

# How to get dry steam, automatic temperature control, and rapid heat-up in processing food

## How to dry out steam in conditioning grain

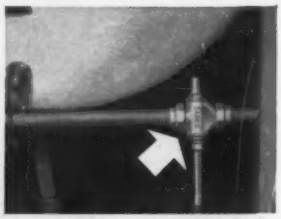


Gwinn's solution: Sarco Thermo Dynamic Steam Trap on grain conditioning unit.

Slugs of condensate and wet steam need not disturb the processing of grain. This problem may be caused by manual operation of valves, which makes it difficult to control the steam's moisture content. It was solved at Gwinn Bros. & Co., Huntington, W. Va., with a system of traps and valves which featured a Sarco Thermo-Dynamic steam trap, Type TD-50. Moisture control is now fully automatic, product is more uniform, and the operator is now free to perform more useful work.

## How to control jacketed kettle temperature automatically and economically

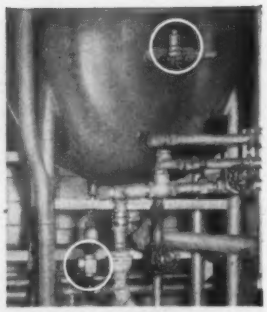
Manual temperature control of steam jacketed kettles is uncertain and frustrating. Install self-powered automatic Sarco temperature controls which are inexpensive, simple, dependable, accurate and save steam. They are easy to install on any equipment, without complicated gadgets that require specialized maintenance. Self-contained, with no exposed mechanism, they are not affected by cross-ambient temperature or bulb elevation.



Sarco self-powered temperature control also cuts down steam waste on kettles.

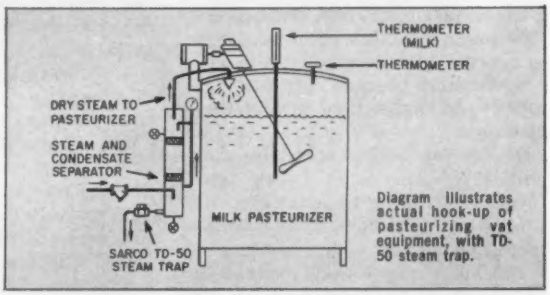
## Get rapid heat-up, maintain cooking schedules —with proper steam trapping.

When cooking schedules aren't being met, and parts of the steam jacket fail to heat, examine your trapping system. Investigation usually shows condensate and air are not being adequately discharged. The problem was solved at F. and F. Laboratories, Chicago, Ill., by equipping each kettle with a ¾" Sarco TD-50 Steam Trap, installed close to the condensate outlet. In addition, the jacket of each kettle was vented by a ⅜" Sarco Thermostatic Air Vent. Now not only is heat-up rapid, but operating cycle is on schedule, and the TD-50's haven't even required cleaning in three years of operation.



Complicated connections and check valves are eliminated on F. & F.'s Kettle. Note simple piping of steam trap and vent.

## Rapid discharge of condensate guarantees dry steam for special pasteurizing problem


THERMOMETER (MILK)
THERMOMETER
DRY STEAM TO PASTEURIZER
STEAM AND CONDENSATE SEPARATOR
MILK PASTEURIZER
SARCO TD-50 STEAM TRAP
Diagram illustrates actual hook-up of pasteurizing vat equipment, with TD-50 steam trap.

Michigan State law requires that air and foam in the space between milk level and pasteurizer vat cover be heated to at least the temperature of the milk during processing. Fogg's Dairy Sales in Holland, Mich., used dry steam at 100 psi for the purpose but had a problem in eliminating condensate prior to introducing the steam into the air space. Installation of a Sarco TD-50 Steam Trap and strainer at the bottom of the control chamber completely cleared up the difficulty by discharging condensate as rapidly as it formed. Mr. Fogg says: "Most reliable and trouble-free trap we've ever used. Body is compact and easily cleaned, important where scrupulous cleanliness is essential."

★ ★ ★ 2961

*For practical information and technical data on steam trapping and temperature control, contact your Sarco sales representative or district office, or write:*

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STEAM TRAPS • TEMPERATURE CONTROLLERS
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**Here are 7 Sound Reasons Why the Thermo-Dynamic® Does a Better Job of Trapping**

1. *Simplicity*—has only one moving part. 2. *Maintenance*—practically zero. 3. *Wide pressure range*—one trap for all pressures from 10 to 600 psi. 4. *Uniform performance*—operates equally well on heavy, light, or no condensate load. 5. *Operates against back pressures*—up to 50% of inlet pressure. 6. *Rugged*—unaffected by superheat, water hammer, vibration, or corrosive condensate. 7. *Minimizes inventory* of spare parts.

**Maintenance Time: 40 Seconds.** If it now takes your maintenance crew more than a couple of minutes to service an ordinary trap, you're throwing away valuable time. This Sarco Thermo-Dynamic can be cleaned, blown out if necessary, and reassembled on the line in as little as 40 seconds.

**For Prompt Information on the TD-50 . . .** or for fast help on the efficient solution of any steam trapping problems, get in touch with a SARCO District Office, Sales Representative, or Distributor. (There's one near you.)

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Thermo-Dynamic* • Thermostatic • Liquid Expansion • Float Thermostatic • Inverted Bucket

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teristics and procedures for the equipment. Moreover, he should become sufficiently familiar with the process as a whole to provide any necessary prior training to production personnel and to act as a trouble-shooter.

After completion and checking of the installation, the process engineer takes over for production. He supervises the start-up and sees to training of the personnel.

For routine maintenance and engineering, he provides liaison between production and engineering. He obtains from production a basic priority of maintenance requirements and then, probably by means of a weekly meeting, relays these requirements, plus the facts on equipment availability, to plant engineering.

It can be seen from this relationship that the process engineer's work with plant engineering brings no overlap. Rather, it promotes coordination to insure that adequate information is supplied to the engineers for their work, while making certain that adequate technical information goes to production.

**3. Research & Development:** Detailed exchanges of information between the process engineer and R&D should be encouraged. A complete report of all formulations should be provided for the process engineer, giving reasons for the process as established, the ingredients used, variables, and alternatives tested.

In the development of new formulas, this information should be provided on a current basis. By the same token, the process engineer should routinely report on process difficulties and possible process improvements.

**4. Labor Relations:** The process engineer works very closely with the labor relations department to insure that no potential personnel problems are built into a new process, and that, where possible, any existing irritating situations for personnel are alleviated.

**5. Industrial Engineering:** The process engineer must work closely with the industrial engineers to make certain that the basis for their studies is compatible with goals of the production department. Further, he must make sure that all phases of production problems are made known to them.

**6. Production Personnel:** Main problem of the process engineer in the production-personnel area is to establish a relationship with these people that builds their confidence in him and promotes their respect for his abilities so that they freely discuss matters with him and confide in him. This is not always easy for the process engineer. His success depends on his capabilities for accomplishing his goals and his talents for recognizing and utilizing the production men's experience.

Here, the process engineer must be extremely generous in crediting production personnel for their ideas and suggestions. Indeed, it is best that he shun the limelight and plaudits—and instead be in the forefront when difficulties are encountered.

This policy should not be construed as any form of subterfuge since, in reality, an idea is like a diamond in the rough, and the man who contributes even the crudest notion has made a valuable contribution if in later development it proves out.

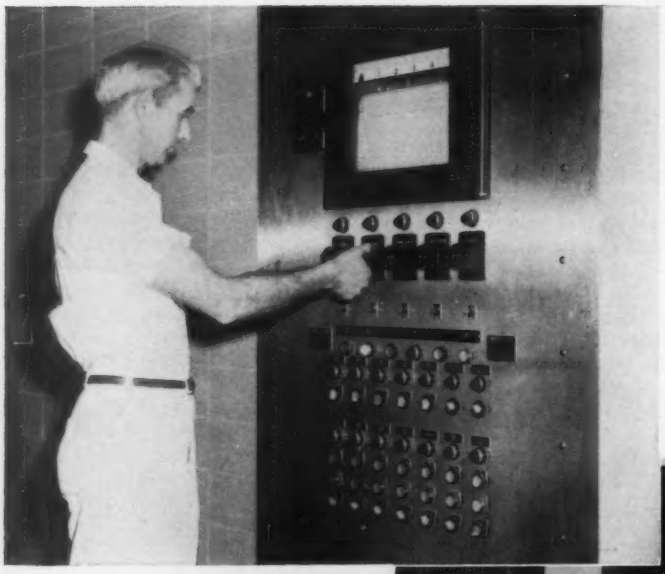
On the other hand, the trained process engineer has the responsibility and available information for proper evaluation of the importance and practicality of original suggestions, and it's his business to recommend the best means for their accomplishment. Therefore, the process engineer should bear the brunt where work on a suggestion fails to bear fruit.

One fact must be kept in mind to avoid confusion: The process engineer does not in any way direct operations of a routine nature. However, if his assistance is requested on technical problems of a non-routine nature, he should be given authority to take over the particular process until it is operating satisfactorily.

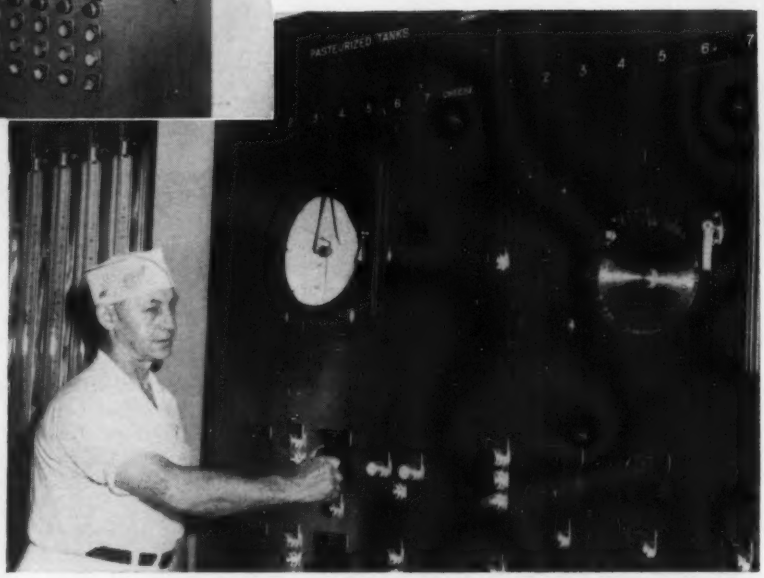
## What Kind of Man?

Ideally, the process engineer is a man with sound and broad engineering training and strong administrative aptitudes and desires. He should be a mature individual with a logical train of thought and judgment. He should be very tactful and capable of directing discussions efficiently. Positive and creative thinking is a must, and the ability to mediate differences of opinion between opposing groups or individuals is a strong asset.

At the same time, the process engineer must be tenacious and patient on basic principles. He must be able to fight long and hard for goals of the production department, and to battle equally long and hard to make non-ideal systems function at maximum.



**FROM PANEL,** weights of ingredients going into preparation of ice cream mixes are pre-selected on digital-type dials.



**ALSO FROM PANEL,** products are directed from process to process. Luminous readouts show process flow.

# Refines Process and CIP Control

**Remotely operated pneumatic valves team up with advanced instrumentation to optimize control over product handling and cleaning in-place**

HANDLING is a major operating problem in virtually every food plant. So Borden Co. worked out a method for processing handling ideas when it constructed its new milk and ice cream plant in Milwaukee. And it saw to it that everyone affected got into the act.

Outcome? Borden went far ahead of the rapidly accelerating pace of improvements in the field of handling. Samples:

1. Integrated batch-sequencing (Minneapolis-Honeywell) of ingredients into ice cream-weigh tank with automatic handling of base mix to further processing.

2. Panel-board control (Ladish) of handling fresh milk from receiving weigh tanks to storage, then to HTST pasteurizers and vats (cheese and by-product).

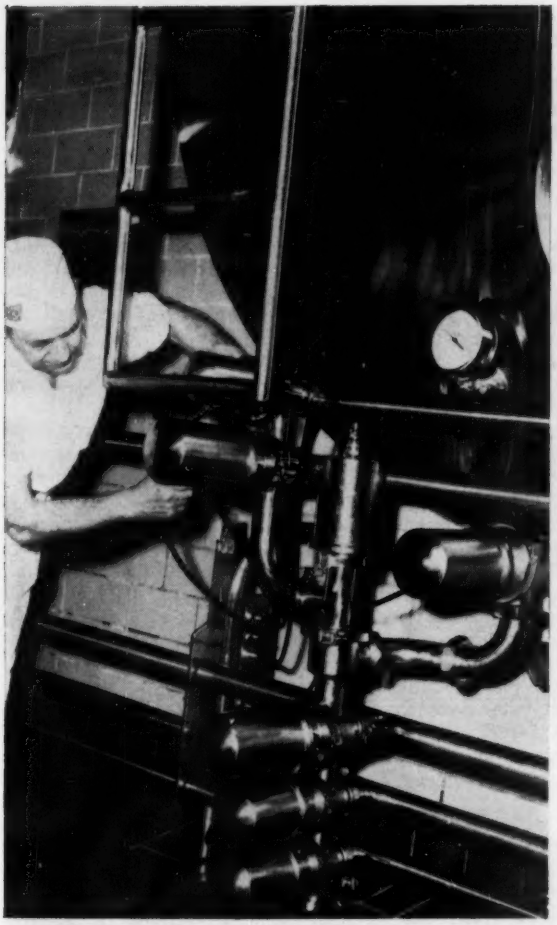
3. Similar control from another panel board for automatic transfer of milk from pasteurizing tanks to seven filling machines.

4. Completely automated CIP system — rinsing, washing and sanitizing — from four control panels (Klenzade and Taylor) in program-sequence fashion.

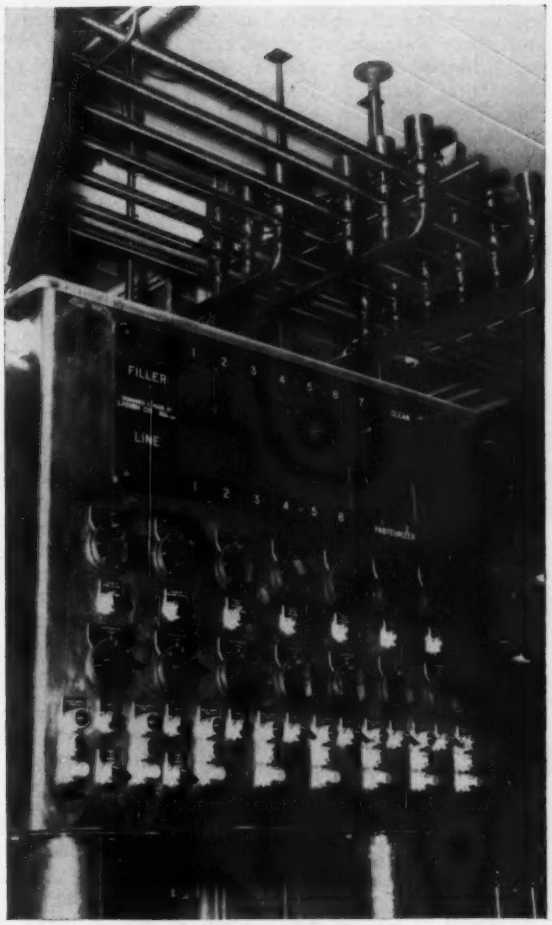
5. Welded pipeline system to provide greater rigidity, permanence, and better cleaning in-place.

Big payoff was the "marriage"

**JOHN V. ZIEMBA**
Senior Associate Editor, "Food Engineering"



**HEART** of the process and CIP control system are remotely operated air valves. Here, they're used to direct flow.




**MONITORED** from this control panel is flow of processed milk and by-products to filling machines.

of process flow with the advanced automated CIP system. It was accomplished through installation of 147 remotely-controlled, electrically-actuated, sanitary-type, pneumatically operated valves (137 on process flow and 10 on CIP sides).

All these advances led to further benefits—Borden's prime objectives. These include foolproof cleaning and sanitizing of equipment, pipelines and storage facilities—as well as more uniform control over product quality.

The new process flow systems, teamed with program-controlled CIP, set high standards for efficiency.

## Weight Selecting

Greater process speed, accuracy, flexibility and economy are assured through front-access (wall-mounted) panel-operated system (Minneapolis-Honeywell) for remote weight selecting of liquid ingredients going into preparation of ice cream mixes.

In operation, six digital-type dials are weight-selected (up to 9,999 lb.) for cream, condensed milk, liquid sugar, corn syrup or water. Through automatic control (or manual), ingredients are sequence-fed from holding tanks, weighed, blended and discharged to further processing. Any number of the six ingredients can also be delivered to weigh-type batch tank (Cherry-Burrell) using electronically-operated load cells—with amounts remotely set or varied as formulas demand.

Operator punches reset and start pushbuttons. Ingredients are then panel-board monitored, in sequence, through separate lines

**ACCESSIBLE** wall-mounted hook-up stations permit rapid connection, by return bend, to cleaning solution feed point.

and pneumatically-operated valves and into weigh-batch tank. As each ingredient is scaled into tank then, through 15-sec. time-delay relay, valve closes and valve on other line opens to permit scaling of next called-for ingredient. In the meantime, panel board pilot lights indicate valve openings as well as operations of ingredient-handling pumps, scale tank's agitator, transfer pump (from batch tank) and filling of four pasteurizing tanks. A recording chart keeps tabs of each ingredient weight scaled.

Also from panel board, selector switches are positioned to transfer ice cream mix from pasteurizers through homogenizers and plate-type heat-exchangers into eight storage tanks.

At end of production day, entire system's put on CIP standby by flicking still another selector switch.

## Automated Process Flow

Pneumatically operated valves to control process flow—from receiving to filling machines—and monitored from two panels? Sure. But go one step further. Now, with electronics, panel-mounted, projection-type luminous readouts show operator what process flow he's selected before punching start buttons.

From first panel, flow of raw products are automatically controlled through 60 air-operated valves. Mounted on panel are six dial-type selector switches (digital) for process-handling milk in and out of seven storage tanks and four similar switch dials. These control feeding and discharging two HTST units, with on-off selector switches below each one. Mounted on same panel board is a program-controlled system for CIP'ing related process-handling equipment.

Switches permit panel board operator to select and start-stop operations that involve:

1. Transferring raw milk from two receiving-weigh tanks to any of seven storage tanks (12,000 gal.).

2. Delivering milk from storage tanks to two preselected separators.

3. Discharging milk from separators to any seven raw milk storage tanks.

4. Transferring milk from one storage tank to another from two selecting dials.

5. Pumping milk from any seven storage tanks to two preselected HTST units from any of two dial selectors.

6. Moving milk from either HTST unit to seven pasteurizing vats, cheese vats or starter room (cottage cheese) from two dial switches.

7. CIP'ing any of seven storage tanks. System's interlocked to prevent cleaning a tank on process cycle. However, a tank not handling product can be cleaned.

Above operations are "alpha-numerically" read out on a sectionalized luminous panel.

A second process control panel (Ladish) supplies milk from any of seven pasteurizing vats to as many filling machines (for bottles, metal containers and paperboard cartons). Remotely controlled from panel are 68 pneumatically operated valves.

Panel-mounted are seven dial-type selector switches (digital), each with an on-off selector switch below. Dials' digits are set up to transfer—to any filling machine—milk from pasteurizing tanks or by-product vats. Seventh switch dial (with interlocks) is preselected to clean in-place any of seven pasteurizing and by-product vats.

Panel board is also sectioned for readouts. Sections light up to indicate what pasteurizing vats are being filled from HTST unit, fillers being serviced from pasteurizing vats, six pipelines handling product flow from pasteurizing vats to fillers and vats being cleaned in-place.

## In-Place Cleaning

CIP is remotely monitored from four panel boards. On these are mounted timed program controllers (Taylor's Flex-O-Timers), valve-pulsing controls (Taylor-Emmons) and temperature controller-recorders. The CIP system contains an 80-gal. water vat with temperature and multiple liquid-level controls, detergent and chlorine pumps, and valves for steam, water and drain. Neon relay lights check out CIP circuit hook up on valve pulsing control panel.

All four CIP panels are equipped with timed-program controllers mated to remotely operated pneumatic valves. These sequentially cycle such pre-selected multiple operations that involve rinsing, washing and sanitizing. Also controlled from panels are temperature, pressure, holding time and concentration of detergents.

Separate cleaning cycles have been Klenzade engineered for:

1. Incoming tank trucks and two weigh and cheese-dressing tanks.

2. Raw milk header system, two HTST units, cream line and the cheese room.

3. Milk-pasteurizing and storing vats, by-product pasteurizing vats and HTST pasteurizing vats and lines to either of seven filling machines.

4. Ice cream mix storage tanks, base-mix vats and ice cream header system.

Timed-controlled system (Flex-O-Timer) comprises time-measuring and CIP-process actuating components. Time cycling is achieved by locking CIP programming into a synchronous motor-driven, direct-reading time dial, sectioned for four different CIP programs. Clamped to dial are program-trip pins for definite intervals selected for sequential CIP functions.

CIP actuating is through electrical switches and air valves, their step disks and a non-synchronous step motor. With dial trip-pins clamped to pre-selected step-disk notches, CIP system is ready for instant automatic cycling. These trip pins actuate the motor that operates electrical and pneumatic functions in accordance with the pre-set CIP program.

Timer is designed for ten separate operating functions, and a cleaning cycle can include up to 23 steps. It triggers a pulsing timer (at valve pulsing control panel) for program-cycling CIP product-handling valves during cleaning operations. This way, these valves, associated with sanitary piping circuitry and processing equipment, are effectively cleaned.

Valve pulsing control panel comprises:

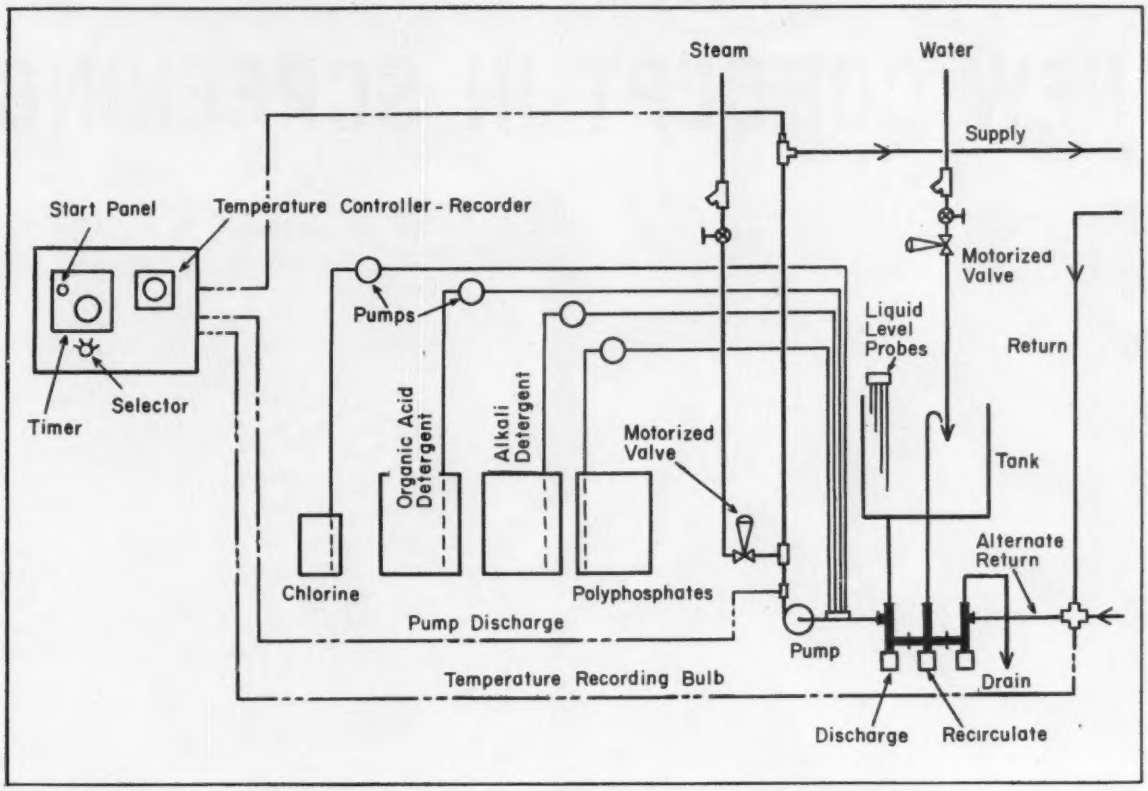
1. Beat timer that creates electrical pulses every 15 or 30 sec.

2. Two-level, 11-point step switch mounted on a small, printed-circuit board plugged into panel. Switch, in turn, is actuated by beat timer.

3. Plug-in output relays (16) providing 32 or 48 output circuits.

4. Banks (16) of ten slide switches, each for selection of steps at which output relays are energized.

5. A 10-position switch for pre-




**SCHEMATIC** diagram of in-place cleaning system in new Borden plant.

selecting step at which resetting occurs.

6. "Run-test" and "run-off-test" toggle switches.

7. Jog button plus two relays associated with beat timer and stop-switch operation.

Valve pulsing control panel is actuated by Flex-O-Timer on CIP recirculation system. Say, for example, recirculating system is set up for lines with CIP product-handling valves and for tanks. An external selector switch will key panel only during line cleaning. Recirculation-system timer also selects pulse rates advantageously slow or rapid during long or short phases of cleaning cycle.

Say, for instance, that circuits, step-wise operation of relays and valves have been programmed. Then valves are actuated in sequence. After last valve's been actuated, reset selector (set at last valve's functioning), resets to start position. This program repeats throughout cleaning cycle at pulse rate (or rates) selected by recirculation system's timer.

Jog button is manually employed to move the step switch as a check only on relay operation, solenoid valves and air-actuated CIP product-handling valves. In parallel with relay coils are indicating-type neon lights.

Spotted throughout the new dairy are 23 CIP hook-up stations (Klenzade). Here 180-deg. return bends are connected to pipelines linked to tanks, vats, etc.

Borden and Klenzade engineers set up separate in-place cleaning cycles for:

1. Storage tanks and pasteurizing vats. Timed, in sequence, are 15-sec. burst rinses (3); wash cycle with 130 F. water and chlorinated alkaline detergent; 30-sec. and 15-sec. rinses; and a 3-min. recirculation with a stabilizing solution.

2. Pipelines and associated air valves. Here, operations are automatically controlled from the valve pulsing panel. Cleaning circuits are automatically changed every 2 min. on wash and 15 sec. on rinse cycles. Lines are given a 10-min. rinse, followed, in succession by a 25-min. fresh-water and by 8-min. stabilizing rinses.

3. HTST and homogenizing units. Both type units are cleaned from two different stations. Each takes a 20-min. acid wash, 40-min. alkaline wash, 20-min. rinse (to drain) and 8-min. stabilizing rinse.

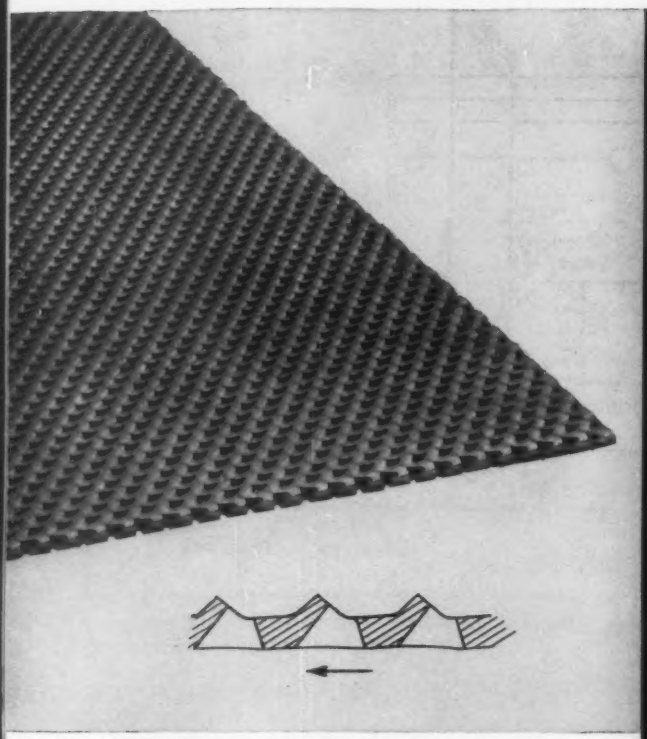
4. Tank trucks. They're cleaned by a procedure similar to that previously mentioned for cleaning tanks and vats.

Concentrated detergent and chlorine solutions are pump-metered from drums into water line. Solutions are pulse-timed according to pre-selected program. Sufficient water has previously been charged and heated to proper temperature in make-up vat. Water level is automatically controlled for desired cleaning cycle through selection of one of four level probes operating on conductance principle.

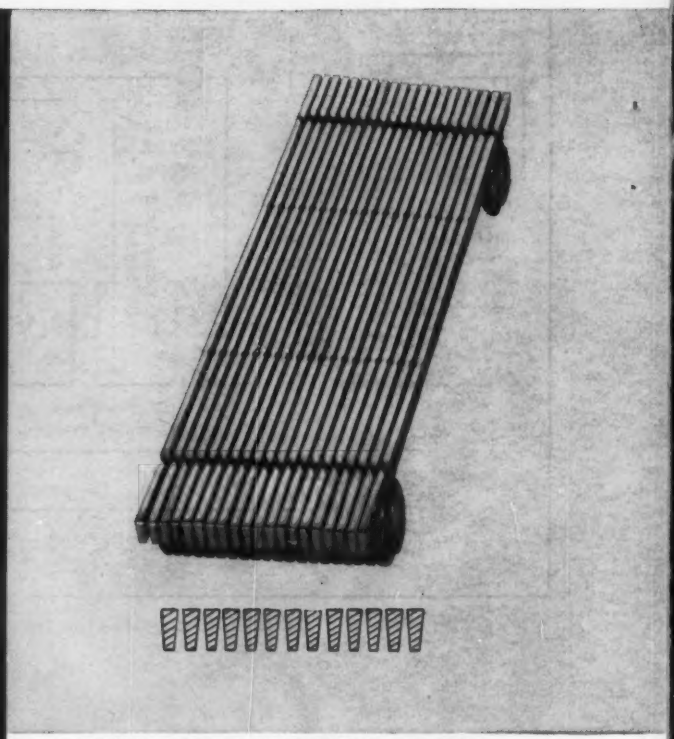
With the complete circuit filled up with detergent or chlorine solution, discharge air valve closes and solution is recirculated for pre-set time. (End)

*from* **NATIONAL-STANDARD**

# NEW CONCEPT IN SCREENING



**CONIDURE*** sheets are available in a complete range of hole sizes and rolled surfaces. The working side of Conidure sheets has shovel-like humps that guide material into the narrow openings, increasing screening action. The extreme taper of the hole prevents clogging or blinding.



**RIMA*** screens can be supplied as rectangular, oblique angled, round or oval beds. The complete range of slit widths and wire profiles accommodates a wide variety of screening and filtering operations.

### *New* **CONIDURE** *Screens*

New Conidure sheets are produced by a unique process of piercing trapezoidal-shaped holes, highly tapered in the screening direction. Sheet thickness can be several times greater than hole diameter for higher capacity and longer wearing life in coal, sugar and chemical centrifuges or on vibrators, separators and screening machines.

*®by Hein, Lehmann & Co., Dusseldorf, Germany

### *New* **RIMA** *Screens*

New Rima shaped-wire screens for coal, paper and food processing and water or sewage filtration have special capacity advantages over standard wedge-wire screens because of high-narrow profile wires that provide larger open area. The unique cross bar and spacing lugs keep wires uniformly separated for greater efficiency in screening.

FOR COMPLETE INFORMATION on New Conidure and Rima Screens, write for new illustrated catalog to NATIONAL-STANDARD COMPANY, NILES, MICHIGAN

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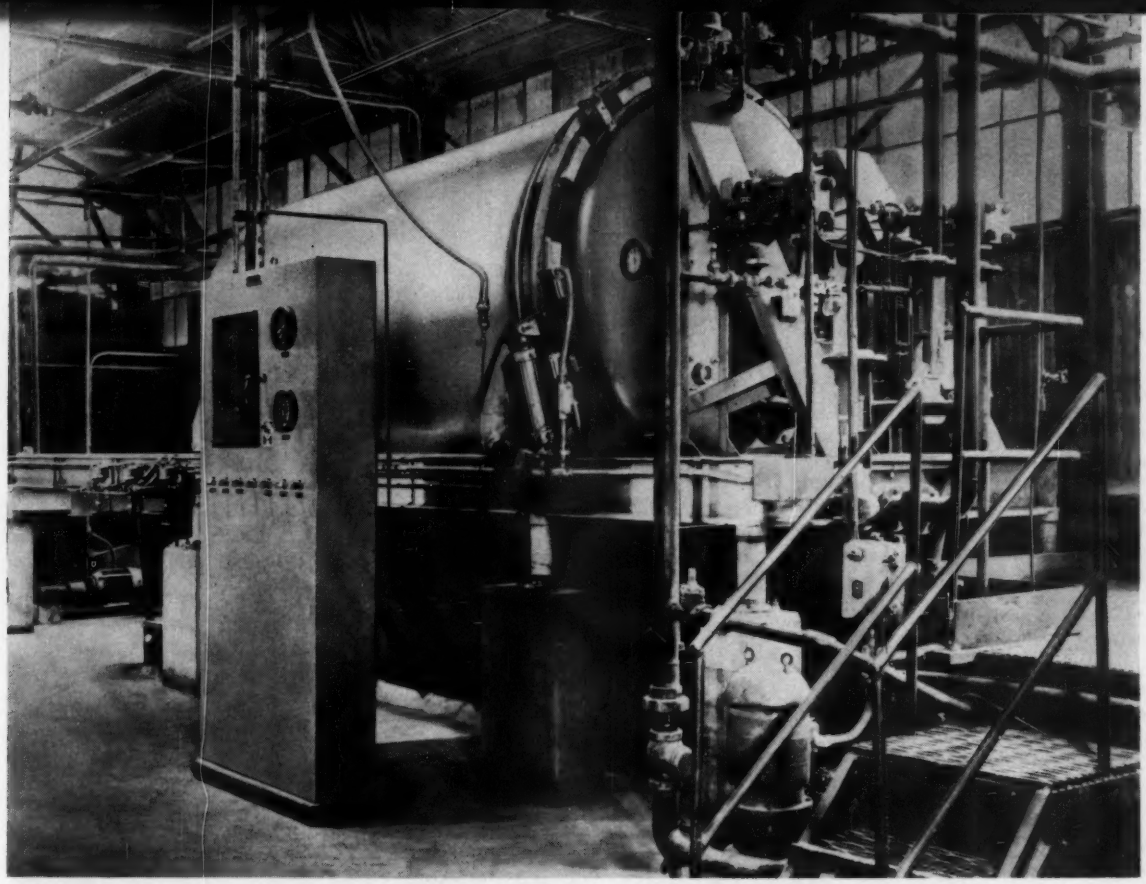


**ROBOTIZED FILTER** is program-controlled through timers to carry out multi-step job of precoating, filtering, air purging, opening, shaking plates and closing unit. Cycle's repeated all day long.

FILTRATION REPORT

*Special FE Report*

# Solve Your Clarifying Problems *by Filtration*

**A new look at your own setup may show how to get more and better filtering done. Here are facts you'll need**

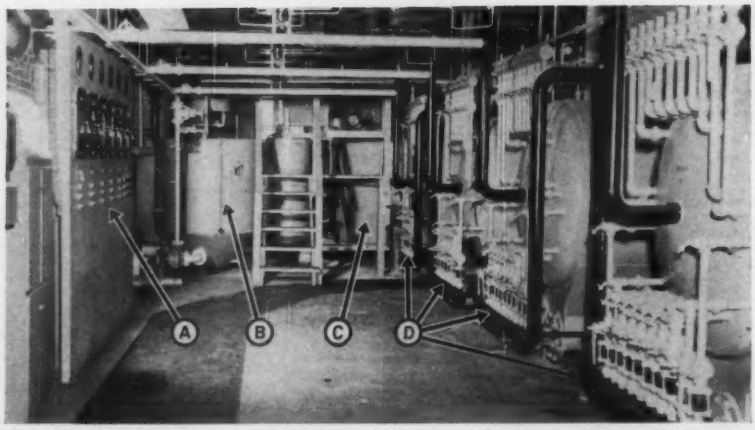
A NECESSARY EVIL—that's how most plant men look on the problem of filtering food products. For it can be one of the dirtiest and toughest jobs in a plant.

**JOHN V. ZIEMBA**
Senior Associate Editor, "Food Engineering"

And, if it weren't for holding tanks ahead of and beyond the units (to take up some of the production slacks), most plants just couldn't operate efficiently, whether they're doing a rough, fine or polishing job of filtering.

Once a filter's been operating for a certain time, suspended solids in product being clarified clog the filter media. Pressure builds up, liquid flow drops to a dribble and the filter's no longer operating efficiently. To give filtration a shot in the arm requires production delays, since filtering must be stopped to clean the unit and to restart the system.

By itself, a filter is nothing more than a unit for: (1) Sup-




**ONLY MANUAL TASKS** required at this automatic thick-juice filter station are during sluicing down and changing leaves. On panel (A) are ranged pressure gages, controllers and recorders, flow regulators, signal lights, start-stop buttons. Also shown are precoat tank (B), sluice tank (C), and bank of filters (D). Dark piping represents feed lines, large white pipes are precoat ones.

porting required area of filter media, (2) storing—or continuously discharging—solids removed from product being filtered, and (3) draining clear filtrate (the product).

But when it operates as the heart of a system, it's important to consider such mutually related factors as nature of filter media, filterability of liquid-solid combination (product to be filtered), and pump's pressure-volume characteristics.

## Some Efficiencies

It's no fluke that filtration systems installed in the past few years operate more efficiently than the old ones. Here's why:

**Flow rates are higher.** Rate of filtration depends primarily upon amount of effective filtering area. Higher flow rates are accomplished by proper treatment of product that's to be filtered.

In some cases, it's done by precipitating most solids in settling tanks or removing them by centrifuging.

In other cases, enzymes (proteolytic and saccharifying) break up gummy materials that otherwise interfere with product's filterability.

In still other instances, changes in product's pH or temperature influence its flow rate. And improvements in filter aids have aided significantly.

**Filtration cycles are longer,** especially with units containing automatically operated self-cleaning devices and ample cake capacities (requiring infrequent cleaning). Filters operating at higher pressures run for longer cycles, and recover more product per unit of time, labor and space.

**More stable filter cakes.** They don't slip or crack with changes in pressures, flow rates or product viscosities. And they're even stable when shutting down the system.

**More uniform and porous cakes** are formed for freer flow and longer cycles.

**Precoat economies are being achieved.** Example's the savings in time and labor during precoating of newer horizontal plate filters.

Eliminated are the fibrous materials (like asbestos) to obtain cake cohesion. In this case, filter aids are gently (and at lower velocity) gravity-floated into position to give uniform cake thickness across entire face of plate, hence a thinner precoat. (421)*

**Effluents are draining freely** in filters with plates designed to reduce flow friction. It's done in one instance with a rigid perforated metal screen supported by raised dimples in filter plate. Screen, in turn, supports filter septum. Arrangement assures unobstructed flow of filtrate—important for large unit volume and for handling high viscosity liquids. (422)

**Cake drying by blow-down** (with air or steam) reduces amount of liquid held in cake from about 35 to 15%. One supplier's designed a patented scavenger plate in a horizontal plate in its horizontal plate filter to recover—almost to the last drop—liquid product left in the unit. (423)

The amount of liquid remaining in filter cakes is important to the over-all cost of filtration. Washing the cakes with water or suitable solvents extracts most of the soluble material in pressure-type filters. Method also is efficient for washing a filter.

**Cleaning time,** along with labor costs, are being slashed. Where a filter's clarifying a product, the amount and nature of solids to be disposed must be considered. If solids can be flushed into the sewer system, then it's a simple matter to semi-automatically discharge them from vertical plate-type filters. These feature built-in sprays, bubble rings, or electrically operated vibrators that drop spent cake from filter's leaves and dispose them as slurries.

Where slurry-disposal isn't feasible or amount of filter area becomes excessive for the vertical-type filters, then filter presses and vertical leaf units with horizontal tanks are employed. Such units discharge semi-dry cakes that can be discharged as is or reslurried for disposal.

Cleaning these units varies with the nature of product being handled. Low-viscosity liquids require just a simple rap with a mallet to drop solids from leaves. But the more viscous the product, then the more difficult the cleaning. Cleaning of filter presses can be greatly facilitated through use of disposable filter paper or similar media that's discarded following each run.

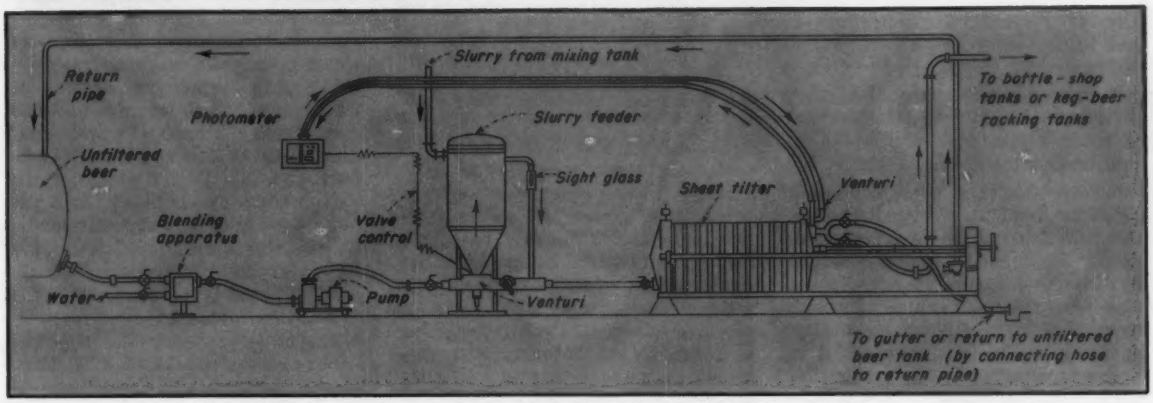
Most solids are washed by counterflow or reverse washing systems. Some can be readily steam-sterilized between runs of successive or different products—even where persistent flavors or contaminants must be avoided.

Although horizontal plate-type

* For more information on this equipment, circle this number on Reader Service Card at back of issue. Other pertinent equipment or systems mentioned in this Special Report will be found similarly keyed for your convenience.

**PHOTOMETER** continuously samples and records clarity of beer as a gage of filter's performance in polishing brew. Combined with filter, it automatically . . .

. . . maintains pre-set clarity by actuating valve at venturi at slurry feeder. Second venturi at filter's discharge recirculates beer through by-pass.




filters are popular, those of larger sizes are more difficult to clean. Smaller size units, on the other hand, employ quick change-over cartridges that are removed so that a cleaned, dressed set can be inserted in a matter of minutes.

**Filters are designed of sufficient** mechanical strength to withstand filtering pressures. And they're constructed with materials that resist products' chemical actions.

**Clarity of filtrate is improved** through careful selection of proper density filter media. Examination of unfiltered product is key to selection of most suitable and economical medium.

**Automated programmed systems** have been recently developed for large-scale operations. They're saving time, labor and filter aids as well as improving products' clarity. In any case, systems are engineered to operate automatically, semi-automatically or manually.

**"Closed circuit" filtration** prevents exposure, evaporation and possible contamination of products.

## What Filters Do

Jobs to which filters are put to use in the food industry are many. Most important, however, is to improve quality of products by removing undesirable solids adversely affecting flavor, clarity, and shelf-life. Then, too, certain products are clarified after they're treated with bleaching, decolorizing and deodorizing agents. Or they must be polished by filtration to remove microorganisms or micron-size particles.

Filtering's also done to save on raw material costs by converting lower grade materials into higher grade products through clarification, with or without decolorizing, deodorizing or similar treatments. Example's the use of turbinado sugar that's readily bleached and clarified at lower cost than refined sugar.

In some cases, filters recover solids. The ease with which solids may be recovered as firm, solid cakes (that can be washed free of traces of liquid and subsequently partially dried by blowing air through unit) makes the plate-and-frame pressure filter particularly useful. Typical examples are the recovery of yeast, cotton seed oil cake (for cattle feed) and fruit pomance (a valuable by-product).

In other cases, waste materials, scrapped or sold at negligible prices, are treated for subsequent clarification and recovery. Typical example's the recovery of usable sugar syrup from confectionery scraps. Case in point's a large candy manufacturer who, instead of discarding 4,200 lb. of imperfect and broken colored candy pieces a week, now filter-recovers clean sugar syrup at ½¢./lb. cost.

## Choosing Filters

Food industry must rely heavily on technical assistance from manufacterers of filtration equipment, on their knowledge of what equipment's available, and on their background of information as to what the equipment can—or cannot—do. Both must work out solutions to specific filtration problems by carrying out tests to: (1)

## FILTRATION REPORT

Determine optimum filtration cycle, and (2) predict effects of changing operating and processing conditions on existing equipment.

To get a good idea on some of the basic principles in filtration, it is well worth knowing that rate of flow is:

1. Directly proportional to pressure differential (between each side of filtering surface areas) and to the extent of effective filtering areas.

2. Inversely proportional to viscosity of fluid and to resistivities of filter media and of filter film (multiplied by its thickness).

In selecting the most economical filter, food plant men look into a lot of things. One's production level. Because of labor savings, continuous filtering is economical and desirable at high production levels, but more difficult to justify at lower levels. The nature of the process, whether batch or continuous, may influence choice between batch or continuous filtration—although production level's still more important.

Process condition may also be a limiting factor in the selection of a filter. For instance, temperature and product (its chemical resistance) may narrow the choice of filter media which, in turn, may affect the equipment type. If a vacuum-type filter can't be used because of temperature limitations, then selection is narrowed to relatively expensive continuous pressure filters or batch-pressure units.

If continuous filtration's indicated, washing requirements and perhaps degree of filtrate-wash separation have an influence. Likewise, if batch filtration's logical, then cake discharge (sluicing away or recovering dry) and washing requirements become significant.

Nature of cake formation in a slurry will dictate if continuous filtration should be used, or whether continuous precoat or batch operation will be sufficient. Continuous filtration may be indicated where cake formations range ⅛ to 2-in. or thicker. Below this range of cake-formation characteristics, continuous precoat or batch systems should be adopted. Included here is liquid clarification involving little cake formation during complete filtration cycle.

Something else to consider are materials used in construction of filters. They influence cost of a filter, and some are difficult to fabricate. Example's the high cost of materials going into the construction of a continuous vacuum filter as compared with a more economical, simply designed and fabricated batch-type unit—which user could just as well consider.

Specifying materials of construction is also important for prevention of operating difficulties, high maintenance costs and sanitation. Case in point's the use of less costly aluminum screens for stainless steel ones that corrode during the clarification of hot gelatin solutions. Better yet, gelatin manufacturers look to possible use of inert materials—perhaps certain plastics—that would withstand high temperatures and the corrosive action of their products.

Heart of any filtration equipment is its filtering surface that blocks passage of suspended solids and permits liquids to flow — through gravity, pressure or vacuum—with freedom. How well the filter medium does this job, without adversely affecting the filtrate, over an economical number of cycles is important.

### Filter Media

In certain food plant operations, filter medium must, as stated, resist a product's corrosiveness or temperature. It should also discharge a clean filtrate and dry cake at a satisfactory rate. Other features include dimensional stability (to resist shrinking and stretching and to withstand wear from scraping and impact that might open holes) as well as its ability to remain open, freedom from "blinding," and easy discharge of solids from its surface.

However, food plant men do have a wide choice of filter media to simplify the job of operating filters at maximum efficiency. In addition to cotton, there are many synthetics. And, of course, there are stainless steel wire cloth as well as screen plates of aluminum, Monel, bronze, etc. available in mesh sizes down to 400.

Development of the many new synthetic fibers in the past few years has made filter media available with improved resistance to temperature and certain products. On the other hand, problem of selecting filter media has been greatly complicated as a result of the many new styles and designs.

One of the first synthetic filtration fabrics was Nylon, with its high tenacity (wet and dry), toughness, elasticity, resistance to heat and many corrosive products. Since then, many others have been adopted principally for use in the chemical industry. These include chemical-resistant Dynel, Orlon, Saran, Dacron, Teflon and even polyethylene. Generally, they're given a heat-setting treatment to make them dimensionally stable and to give them controlled porosity and smooth surfaces.

### About Filter Aids

Filter aids (pulps and special types of diatomaceous earths) are employed to remove small, soft particles as well as increase and maintain a desirably high rate of flow. They're mixed into a slurry with product to be filtered for purpose of obtaining better filter cakes.

### Fields of Filtration Applications

**Baking powder—Beer, cider, soft drinks and wines—Cereal products—Coconut products—Coffee, fruits and tea concentrates—Candy scrap, chicle, chocolate—Casein, curd, lactic acid, lactose, malted milk, milk, rennet, whey.**

**Cocoa butter frying fats (for doughnuts, potato chips, breaded meats or fish), lard, olive and salad oils, shortenings.**

**Flavors and extracts—Food colors—Fruit juices—Gelatin— Gluten—Infant foods—Jellies, jams, preserves—Maltose and malt syrup—Meat extracts—Pectin.**

**Soups: Clear liquid types—Soya proteins—Sugars and syrups: dextrose, glucose, honey, molasses, sucrose, corn and sucrose syrups—Vinegar—Water—Wort—Yeast.**

Noteworthy has been the recent development of a group of synthetic polymers (424) that rapidly flocculate finely divided particles in liquid suspension, speed settling and filtering. As filter aids, these complex molecules make filter cakes firmer and more porous, prevent filter-cloth blinding and increase washing efficiency.

To promote good filtration, a filter aid must be: (1) Light in weight so it remains in suspension, (2) inert so it's not affected by product or the other way around, and (3) of low resistivity and yet hard and incompressible.

In reference to how pressure affects the resistivity of filter film, it's well to point out one brewery's experience. It hooked up two filters in parallel with same 2-in. discharge line to increase flow rate to 150% and volume of beer filtered to 130% per run. Initial pressure at filter outlet was 31-34 psi. When a second discharge line was installed (in parallel), rate went up to 180% and volume to about 200% with an initial discharge pressure of 18-20 psi.

Where filter aids are used, a filter must have the cake capacity for the added solids introduced. Ample cake capacity is obtained by selection of filter frames of proper thickness.

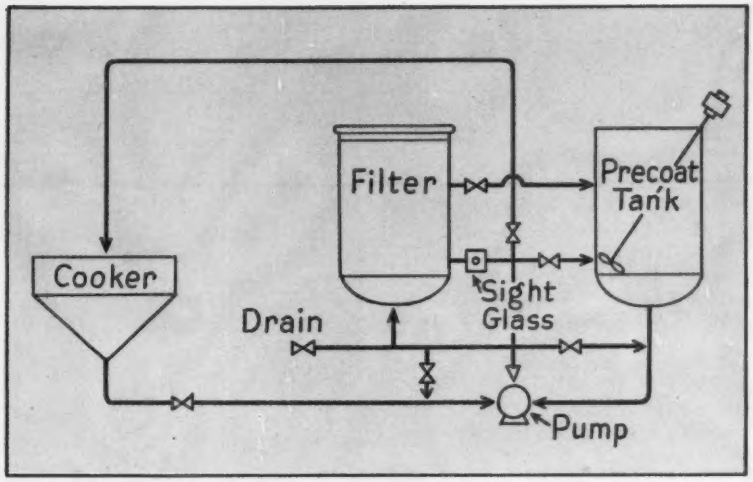
## Filter Accessories

Special features being built into filters are designed with three prime objectives: (1) To improve quality, (2) increase efficiency, and (3) reduce product losses.

**Greater clarity control.** Hooked up to a filter system is a continuous turbidity monitor (425) that measures 0.05 ppm. suspensions without color affecting the readings. Dual-beam system consists of detector and power units, operates on principle of comparing fluid-transmitted and suspended particle-scattered lights.

Another unit — a Swiss-made photometer (426)—is being used in some breweries to record and control turbidity during final beer filtration. It maintains pre-set clarity by automatically opening valves wider when clarity of beer drops below set point and by recirculating filtered beer through by-pass.

Also sight glasses, sample cocks and individual control valves (427) are being employed for each leaf for continuous control of clarity. Should any leaf not function properly, it can be shut off without disrupting the operation.




**CONTINUOUS FILTER SYSTEM** clarifies frying oils during cooking operation. It's designed for fryers handling potato chips, breaded meats and fish. If needed, double filtration station may be hooked up to frying oil-clarification system.

**Higher efficiencies.** Two outstanding recent developments have improved performance of filtering operations. One's an automated programmed system for sequencing the multi-step filtering operation (428). It consists of a pre-set timed-program controller hooked up with a filter specially designed for automatic cleaning.

Special features are built into filter to: (1) Retract filter tank (to quickly open and expose filter), (2) vibrate filter's elements (to drop spent filter cake), (3) dispose waste cake by collecting in V-bottomed hopper and discharging with a worm-screw conveyor.

Other special features built into filters to make them operate more efficiently are:

1. Automatic flow regulator on filter's discharge line to control filtration cycle and to eliminate manual pressure adjustments on pump's side of filter. It compensates for increases in resistance to filtration by maintaining constant flow at filter's rated capacity during the cycle. (429)

2. Eccentric-type electrical vibrator that shakes clean filter leaves. Job's done in about 10 sec. instead of ½-1 hr. by the manual method. (430)

3. Specially designed pressure-type diatomite filter that automatically cleans and removes spent filter cake. Individual plate shut-off valves, and sight glasses make it possible to blow cake dry with limited air supply. Plates are then mechanically rotated from horizontal to vertical positions. And, by tapping an external agitator bar, spent cake drops from plates and onto discharge-screw conveyor. (431)

4. Internal sprays that sluice filters. They can be independently valved for individual operations under low pressures. (432)

5. Filter cake-thickness detector eliminates problem of exceeding solids capacity of filter leaves with bridging and subsequent damage to filter parts. When predetermined thickness is reached, an alarm sounds as filter's taken off the line and into cleaning cycle by remote controller.

Indicator determines pressures at two sensing points: One at filter tank, and other slightly inside filter cake. At start of filtration cycle, both pressures are the same until cake thickness increases (when lower pressure's sensed). A differential pressure switch (sensitive to 10-in. water head) compares both pressures, closes electrical circuit to start next step in filter cycle. (433)

6. Pull-out roller carriage slide that permits easy removing and replacing of individual filter plates. (434)

7. String-discharge filter for removing high-protein gluten cake (derived from wet milling of corn) that causes scraper filters to bog down. (435)

8. Plate-rotating mechanism that quickly converts unit from horizontal- to vertical-plate filter. At end of filtration, cake is blown dry with air pressure (10-15 psi.). Plates are then mechanically rotated to vertical position so cake can be knocked off by vibrator or

by tapping (with hammer) external agitator bar. (436)

9. Quick-opening cover and hydraulically - powered retractable tank for fast cleaning. (437)

10. Plates designed with two large outlets that more than double flow capacity (even during precoating) in same size plates of other filters. Outlets are on top and below bottom of plates to assure complete plate drainage. (438)

11. Interior plate structure consisting of two dimple-embossed perforated disks facing each other. In so meeting, dimple projections form a strong non-collapsible center section with unrestricted flow space. (439)

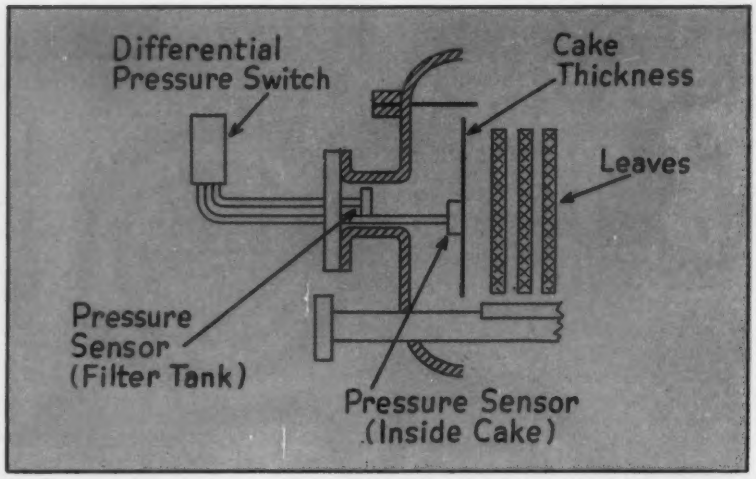
## Automated Systems

A typical timed-program system will "robot" filtering cycle by operating through relays and valves to actuate and "interval" these steps in a typical pressure-leaf filter operation:

1. Fill filter by opening and closing filter inlet and tank vent.
2. Precoat filter by opening and closing precoat tank valve, filter inlet, precoat outlet and by starting and stopping precoat pump.
3. Filtering by opening and closing filter inlet and outlet and by actuating and stopping main pump.
4. Emptying filter by opening and closing filter drain and vent.
5. Cleaning by opening and closing filter drain and vent and sluice inlet and by starting and stopping rotating or vibrating motor.

Basically, the controlling system comprises two major components for time-measuring and for process-actuating. Time-measuring is accomplished by locking process programming into a motor-driven time dial with trip pins for intervals when filtering steps are to take place. Process-actuating is handled by switches and air valves, with dial trip pins setting (through motor) operating the various electrical and pneumatic functions according to preset filtration program.

Control system need not be so sophisticated. Five-step sequence (above) could operate through a 5-position timer. Motors to operate pumps and other drives could be turned on or off with switches on timer. To put cleaning and precoating operation into service, a pressure switch (operating from filter pressure) could be used. As soon as maximum filter cycle-end pressure has been reached (30-40 psi), cleaning and precoating cycles would start. And, when completed, filter would be again put on stream automatically.




**THICKNESS DETECTOR** eliminates problem of exceeding solids capacity of filter leaves. When pre-set thickness is reached, alarm sounds and filter's automatically taken off line by remote controller.

## What Filters Are Doing

A lot of engineering's going into new filtration systems. Here are typical examples of what's going on:

Specially-designed, fast-action, heavy-duty filter is mated with a pre-set timed-program controller to automatically sequence filtering operations.

Operator simply jabs a push-button to start operations. Then robot cycle timers take over through time-delay relays, activating air-operated valves and starting pump to recirculate liquid products through filter and holding tank. After filter plates are precoated, time-delay relay stops timer. Another relay energizes to close air-operated valve to holding tank and open one to product-storage tank.

Filtration cycle starts, and it's timed to when filter pressure builds up to set point. Then timer kicks out, stopping pump and repositioning valves for air-purging of unfiltered heel through filter plates and drain valve in recirculating line to holding tank. System's timed for product draining and drying cycle until time-energized relays actuate hydraulic rams that open filter's stationary cover and then retract filter tank riding two rails.

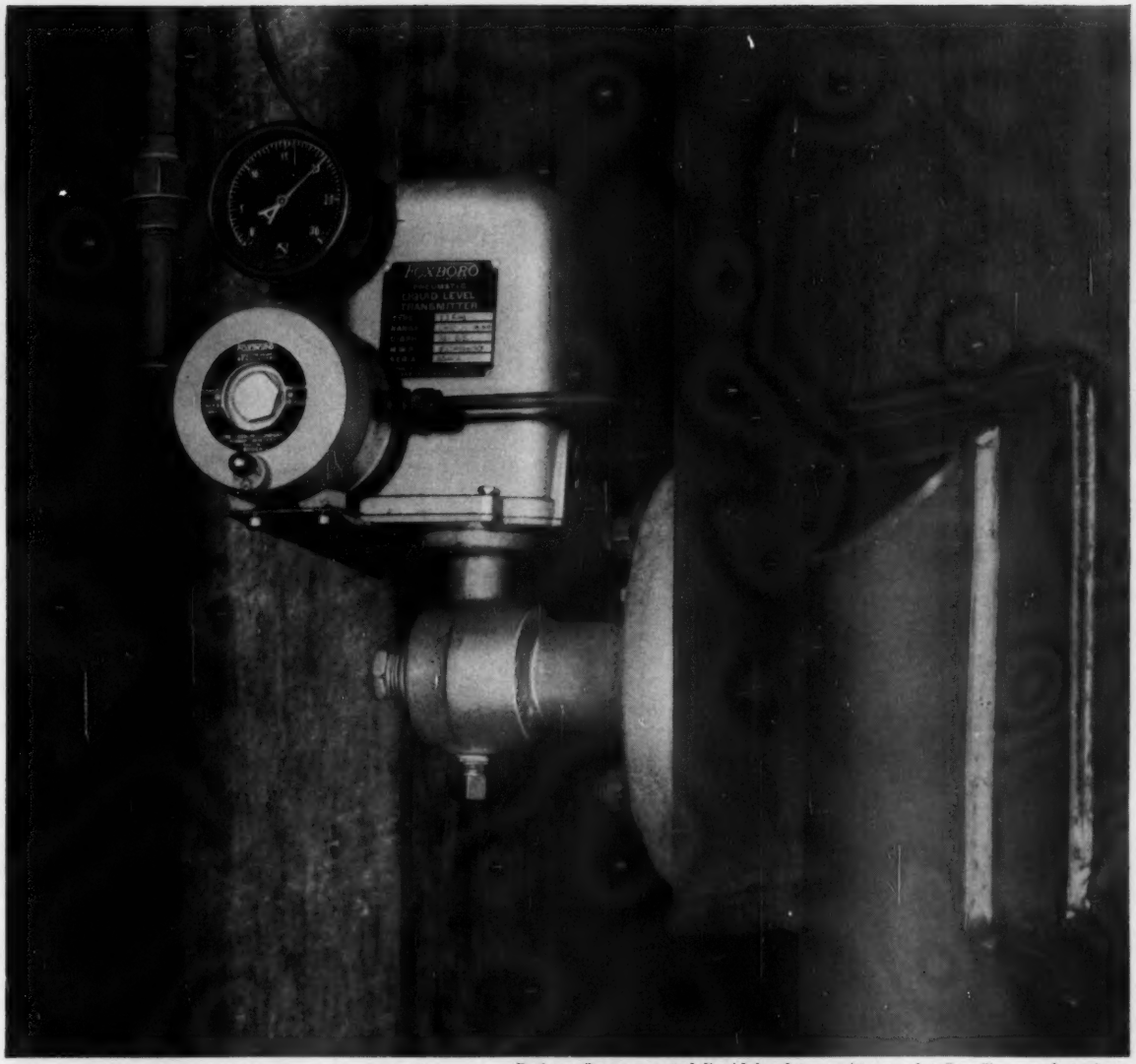
Now, with filter in open position, timer automatically resets, starts air-operated virbators (one on each side) rod-linked to filter plates. Vibrators are timed to shake filter cake loose from plates. Spent cake drops into V-bottomed hopper, where it's discharged by worm-screw conveyor. Then, through timers, rams seal filter. Timers then reset for another cycle. (440)

Only five self-sluicing, leaf-type filters are required to do the job of eleven plate-frame units formerly used to clarify thick juices at a sugar refinery. New system saves company $19,000 annually.

Typical filtration rate per square foot of area is 7.9 vs. 2.5 gph. per sq. ft. Completely enclosed units offer high degree of cleanliness and sanitation. Moreover, they reduce filter-cycle time, handle higher density juice.

Other benefits: Filter-cloth operation and "take-apart" jobs are abolished. Cleaning down-time has been slashed from hours to mere minutes with minimum amount of labor. System no longer requires washing and laundering filter cloths. Instead, new filter medium is applied at each cycle—at reduced cost.

New self-cleaning units comprise steel shell with inside series of 22 Monel leaves (500 sq. ft. filter area) vertically mounted on hollow central shaft. Leaves are of




Foxboro flange-mounted liquid level transmitter on 1st fine fiber wash tank at Union Starch and Refining Company's wet corn milling plant, Granite City, Illinois

**UNION STARCH & REFINING REPORTS:**

# "Faster tank clean-up – less instrument maintenance with Foxboro Liquid Level Transmitters"

"We leave our Foxboro Liquid Level Transmitters right on our tanks at clean-up time," reports Robert Hays, Chemical Engineer at Union Starch & Refining Company, Granite City, Illinois. "The transmitter's flange-mounted, stainless steel diaphragm gets scrubbed right along with the vessel wall — without affecting its high accuracy of performance at all."

Foxboro Type 13 FA Level Transmitters have no floats or bubble-tubes — nothing to corrode or plug-up. 3-15 psi output signal operates standard recorders and controllers without the use of signal converters. And the 13 FA is available with elevated and suppressed ranges when process requirements make these features desirable.

For accurate, trouble-free level measurement and transmission, the Foxboro Type 13 FA Transmitter is your answer. Accurate to ± ½% on all types of liquids — from water, to highly viscous and corrosive liquids.

Ask your nearby Foxboro Field Engineer for full details, or write for Bulletin 458-52. The Foxboro Company, 307 Neponset Ave., Foxboro, Mass.

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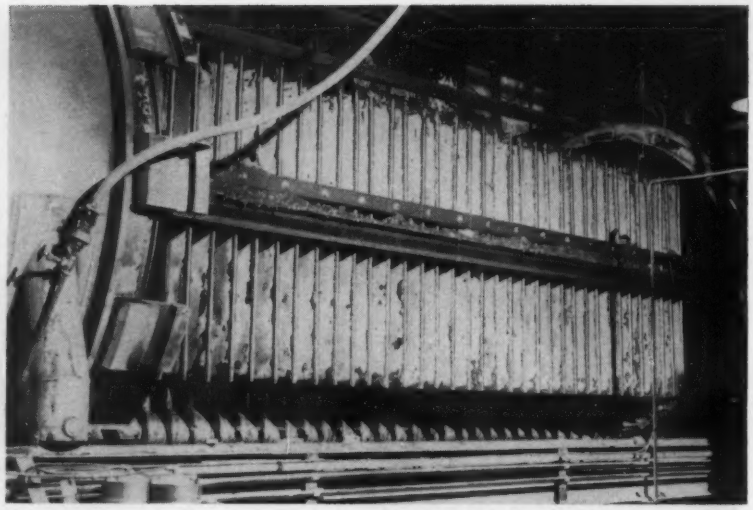
CIRCLE 55 ON READER SERVICE CARD 55

5-screen design, with center mesh screen providing rigidity and serving as drainage channel. It's covered on both sides with two 8-mesh wire back-up screens supporting two 60-mesh outer covering screens.

Filters operate this way: Juice flow from manifold to each leaf is controlled by an individual valve. This way, single leaves are cut out of action (no need to shut down whole unit). Funnels align leaf outlets with discharge pipes, and plates are changed with individually controlled pressure sprays (40 psi. hot water). Spent cake is discharged (without opening filter) into trough bottom with screw conveyor.

Panel board operates through air-actuated instruments to record level of incoming juice in tanks. Control air signal (proportional to tank level) is transmitted to air-operated flow controllers hooked up to each filter. Control may be by-passed when filtering on constant flow rate. (441)



**ENGINEERED** into newer filters are special features that automatically retract tank to expose plates, shake off spent cake so it drops into conveyor trough for disposal.

## Controlling Turbidity

**Latest advance** in final beer clarification has been the recent transition from pulp to powder-using filters. New system produces brilliantly polished beers with shelf-life equal or superior to pulp-filtered products, saves materials and about 66% labor. Cost of pads and filter powder is about 0.6c. per barrel of beer, and life of pads is 50,000 bbl. minimum.

System employs plate-and frame (30) filter with 31½-in. sq. pads and photometer (Filtrox). It also features slurry feeder that's pipe-connected to filter and pre-mix tank to eliminate interruption of filtration. Filter is first precoated with filter aid and asbestos powder prepared in a slurry in pre-mix tank. After precoat is built up on filter, water is expelled and beer is fed to system. Filtration proceeds under instrument control until unit is opened for washing. After filtering 2,000-3,000 bbl., pressure drops (from 60 to 20 psi.) and filter is opened to wash accumulated material from pads and apply a new precoat.

After washing, filter is closed and water-flushed. Then, at the start of following cycle, it is backwashed at one-half filtering rate (60 bbl. per hr.). When discharge water's clear, new precoat's added to filter.

The photometer is a direct-indicating unit for measuring absorption and turbidity according to null method. It maintains a record of filtration for each cycle. Beer sampling to meter is through a plastic hose by-pass system. To maintain pre-set clarity, unit actuates valve at venturi on slurry feeder, opening valve wider when beer drops below set standard. Another venturi at filter discharge produces a pressure differential that serves to recirculate beer through by-pass. (442)

## Purifying Frying Fats

**Removal of particles** burnt during the fat-frying of potato chips is through use of clarification system comprising 24-in. dia. vertical pressure filter containing seven leaves (42.5 sq. ft. filter area), open steam-jacketed mix tank and 50-gpm. pump. System operates on batch or continuous basis, depending on burnt-particle load. It employs filter-aid precoat in the clarification of hot oils recirculated from fryers through filter. It was designed to eliminate charred particles that speck potato chips and shorten product shelf-life. (443)

**Frying oil filters,** hooked up with continuous cooker, handle high sediment loads, withstand high temperatures. Employed are easily-cleaned paper or rotary screen units (single- or double-stage) to automate filtration in the 8- to 200-gpm. range. While filters are permanently hooked up with fryers, they're equipped with by-pass to storage—for overnight holding of clarified oils or for cleaning the system. (444)

**Similar filtering setup** has been designed for continuous clarifying of frying oils loaded with charred particles from breaded and battered fish, seafoods, chicken parts, onion rings, etc. System consists of duplicate, instead of single, filtration station with precoat tank. Frying oil is circulated through filter during entire frying cycle at rates from 30-50-gpm. (445)

**Mobile,** electrically operated fry fat-filter functions without filter aid. Fat drains from cooker through intake hose, eliminates job of opening drain cock under fryer. Fat then filters through fine porous-type cartridge units with several times more filtering area of equal circumference disk. Residue in fat chamber of fryer is cleared by flushing hot filtered fat that's pumped back into cooker. Impurities are drawn out of fryer with intake hose, and then filtered fat is pumped back to fryer. (446)

**Removal of stearines** from winterized oils is expedited with a filter employing vacuum - type plates in an open tank cooled to 45F. Filtering system doesn't require a cold room, gives 2½ times the flow per sq. ft. of filtering surface than conventional methods. At end of filtering cycle, plate assembly can be lifted out and im-

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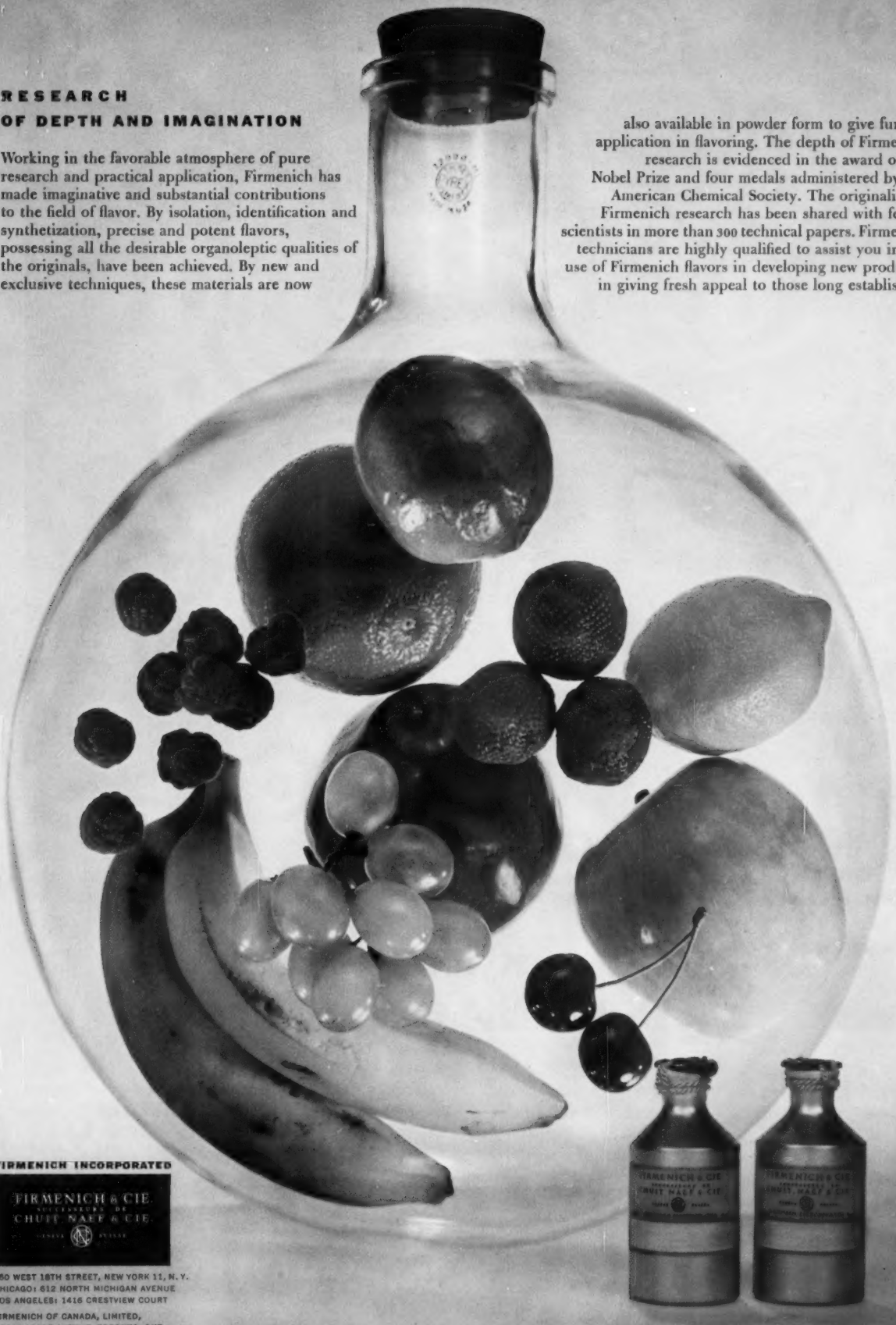

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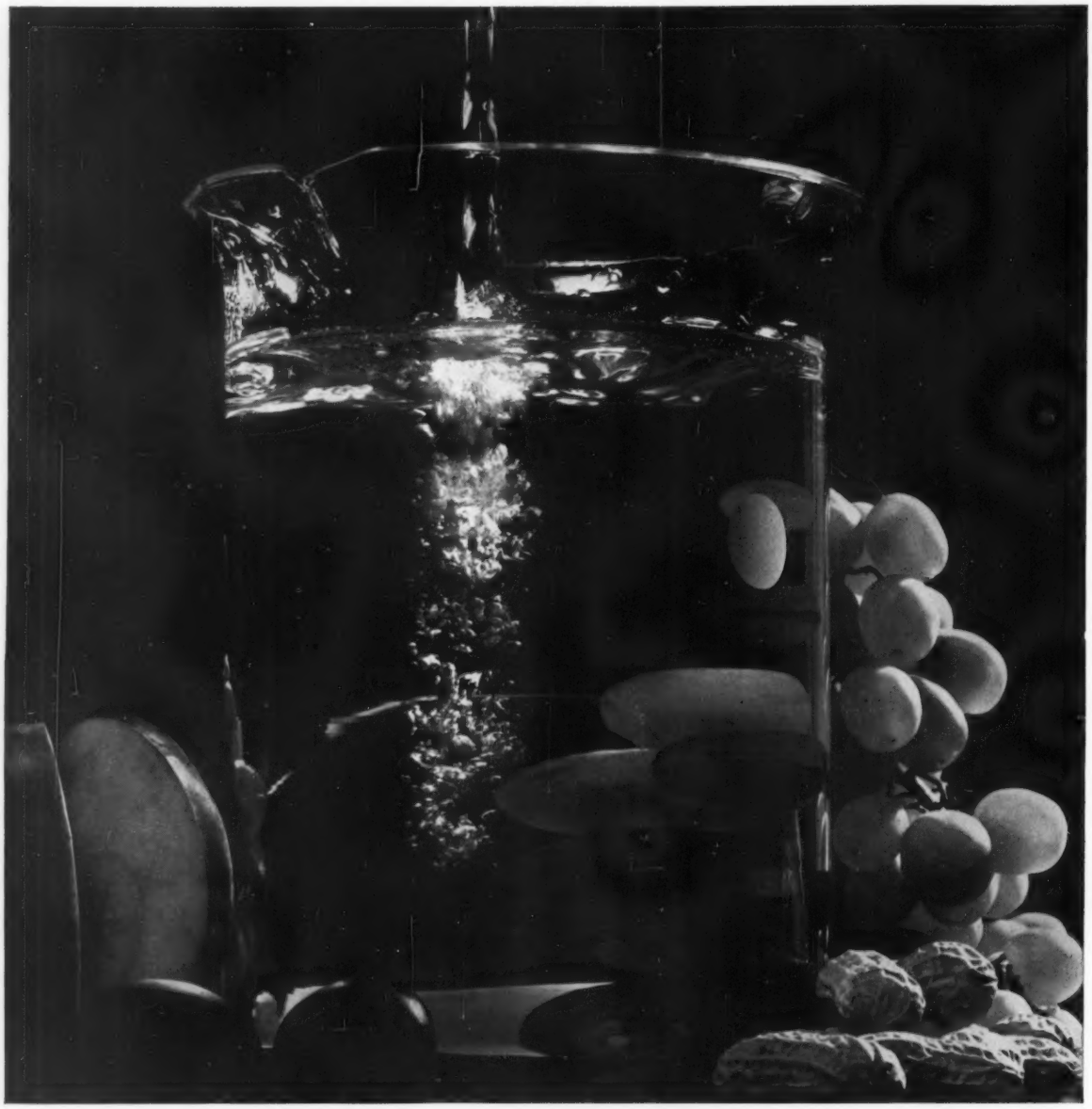

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Celite's low density means greater surface coverage per pound. Processed from the largest and purest diatomite source, it has the highest degree of uniformity in the industry, assuring you of consistent results. Celite offers the widest selection of standard and special grades giving you the exact degree of clarity needed. Today, Celite grades also include Celite perlite. For details on all, see your J-M Filtration Engineer or write Johns-Manville, Box 14, New York 16, N. Y. In Canada: Port Credit, Ontario.

*Celite Division filter aids, when used as such, are not considered food additives as defined by FD&C Act Amended, Section 201(s).*

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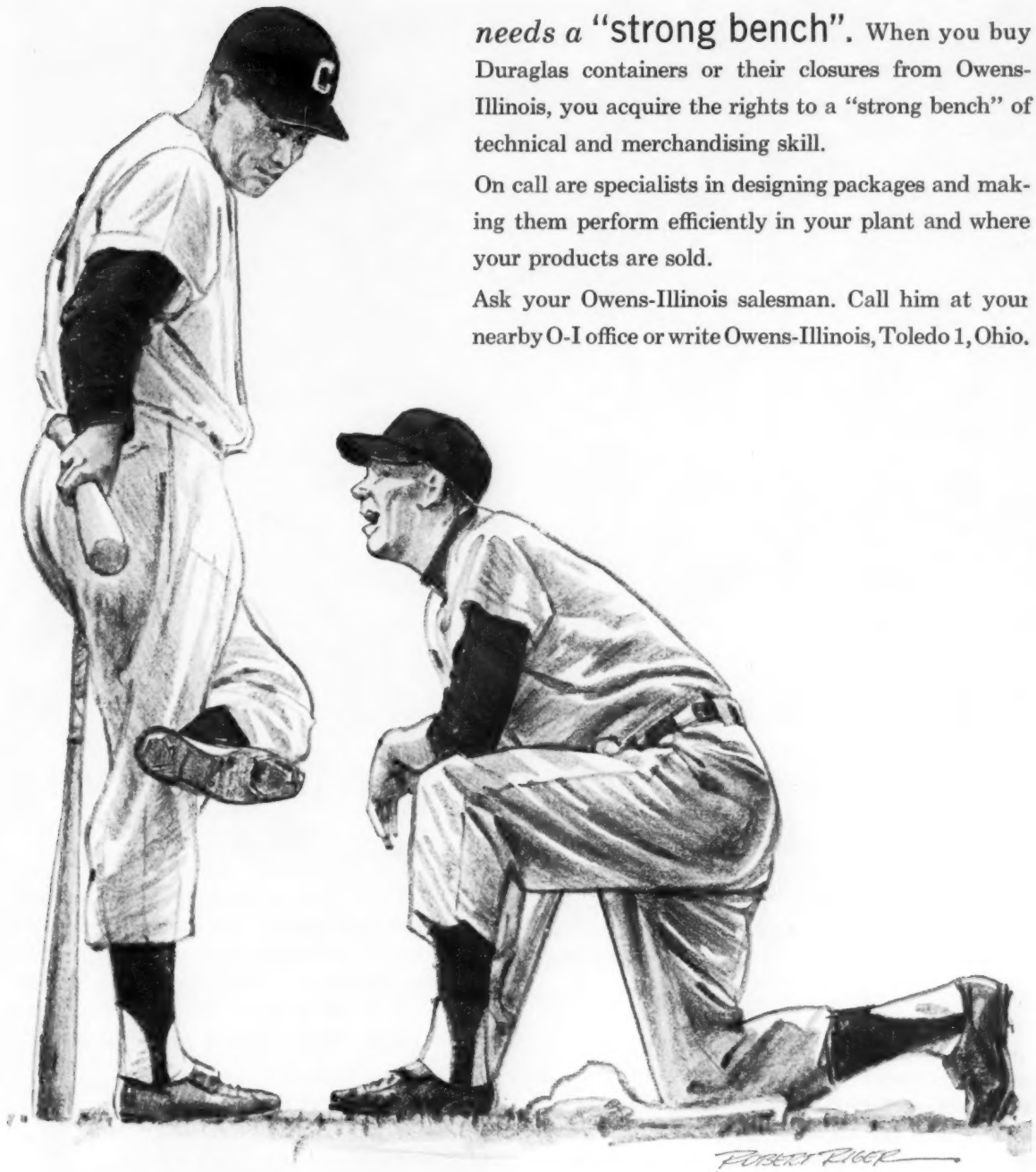


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Facilitating waste disposal is only one of the many ways in which RHOZYME diastatic enzymes can be used industrially. Their liquefying, saccharifying, or modifying actions on starch are also useful in processes such as: **Processing of Precooked Cereals**—by permitting higher-solids processing without raising viscosity and thereby increasing drum-dryer capacity. **Recovery of Sugar from Candy Scrap**—by liquefying the starch and thereby permitting color and flavor removal at higher solids levels. **Production of Corn Sirup**—by saccharifying corn starch to make sweet, non-bitter sirups. **Bread-Making**—by modifying bread starch for better texture, grain, and shelf-life. **Production of Chocolate Sirups**—by lowering viscosity so that high-solids sirups pour readily.

Additional uses include . . . preparation of fermentable sugars from grains, corn, or potatoes . . . any type of starch conversion where high concentrations of maltose and dextrose are desired . . . starch modification for paper coatings and adhesives . . . and the production of cold-swelling laundry starch.

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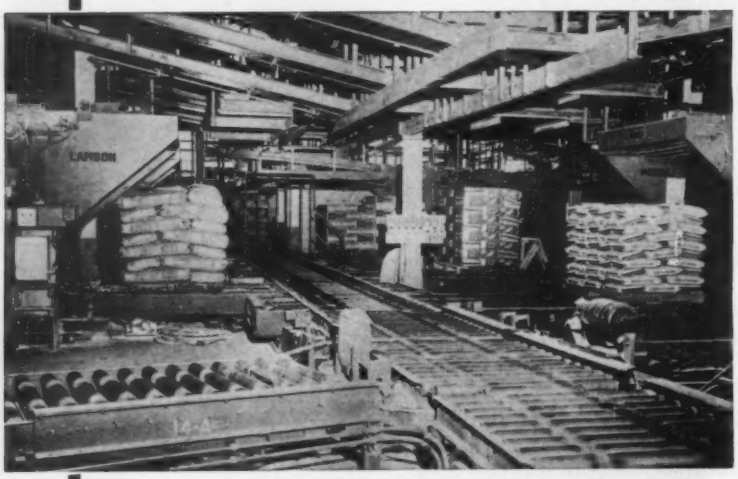

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# FILTRATION REPORT

mersed in melt-off-and-wash tank to also recover stearine. (447)

## Handling Fruits

**Continuous fruit juice** extraction process abolishes conventional method of charging fruits onto filter cloths built up into stacks separated by wooden slats, and of squeezing in hydraulic press. Employed, instead, are continuous screening centrifuge - type juice extractor (50 gpm.) and precoat filters (165 sq. ft.). Combined units handle 1 million lb. of fruit per 24-hr. day, require no pectic enzyme - clarification treatment. Filter operates on 24-hr. cycle: 1 hr. to precoat, 9 to filter, 1½ to flush and rebuild precoat, 8 to filter juice and 4½ to wash, disconnect and clean pipelines. (448)

**Combination filter-strainer** consists of stainless steel tank with filter cloth inserted between two stainless screens and inner displacement bell to level out flow (15,000 lb./hr at 50 psi.) by dampening pump pulsations. Unit strains seeds, fruit pulp or foreign matter from ice cream mix. Strainer also filters milk and other products when filter cloth is inserted between perforated screens. (449)

## 9 Other Advanced Units

A new cartridge-type filter catches fine bits of sediment (up to 5 microns) suspended in beverage water. It has long working life, saves time and labor and reduces filter changes.

It operates this way: Water is pumped through sand and gravel filter, next goes to activated carbon unit for removal of residual chlorine and other odors and then to paper-mesh filter. The water is next chilled to 34F. by surface coils and given a final polishing prior to carbonation.

Replacing formerly used paper filters are three white cellulose-type cylindrical cartridges within a removable metal housing. Cartridges take about 6 min. to change every month. Used to require every-other-day changing of filter paper, and change-overs took about 15 min. And there's something else. Filter paper

breaks and causes shut down of bottling lines. Not so with cartridges. (450)

Automatic self-sluicing filters have reduced sugar beet juice-clarifying costs 50%, increased flow rates and assured high-volume flexibility. Units employ Dynel cloth-covered plates and selected filter media to get 12.5 gal. per sq. ft. per hr. flow compared with 2.5 with former plate-and-frame filters. Flow volume varies widely without significantly effecting juice clarity or length of filter cycle. New system has five units at filter station, requires one instead of former three men when sluicing down or changing plates. Otherwise it's automated.

System fulfills these requirements: (1) Operates one, or all, filters in variance with juice flow; (2) restricts maximum flow per filter to any desired rate, and (3) runs any one, or all, filters at any desired constant flow rate. (451)

## Gas Purifier

A new purification system has been designed to remove sub-micron particles, oil vapors and objectionable odors in $CO_2$ and compressed air lines. In bottling carbonated beverages, traces of oil and other impurities flatten the drinks and impart objectionable odors. This gas-and air-purification system is also employed for filtering and deodorizing edible oils to improve taste and clarity. Compressed air, used with counter pressure chamber on filter, also presents contamination problems.

Unit comprises a pair of diatomaceous earth ceramic filter elements installed on either side of activated carbon canister. First filters out solid particles entrained in gas and also absorbs oil vapors. Carbon chamber removes odors. Diatomaceous filter (of fine porosity) in third chamber takes out yeast, bacteria, mold spores and other particles. (452)

Using a retractable tank-type filter with 400 sq. ft. of filter area, a midwest brewery is now filtering (directly from fermenters) a full day's requirements in just 8½ hours. Brewery use to employ several filters, running three shifts to handle the same volume. In addition, filtered beer is of such high quality that final polishing is merely precautionary. And dry cake recovery solves its sewage disposal problem. (453)

Three filters equipped with programmer controls are automatically stopping, cleaning and recharging units employed in the filtration of pectin. Installation has eliminated five men and brought about significant reduction in filter aid costs. Through use of monofilament woven Dacron, longer wearing synthetic has reduced cost of filter cloth, assured production of filtrate with greater clarity. (454)

Water filter employs no valves, pump or flow controller, prevents wasteful use of water for backwashing and rinsing. It doesn't develop a negative head and, at the same time, abolishes channeling and upsetting of the filter.

Piped water flows through sand, strainers and false bottom, then up effluent duct for process use. As head loss increases, water rises in backwash pipe and then spills in backwash pipe to start backwashing. Syphon pipe draws water from storage section, upward through sand bed to float dirt to waste. At low-storage level, air enters tube to stop syphoning and prevent further backwash. Flow automatically reverses, and filtered water goes to storage. (455)

## Versatile Tilt Unit

Worm gears move tilt-type filter press (2-35 plates) from horizontal loading to vertical operating position—without filter cake dropping from plates. (456)

Differential pressure runs an automatic backwashing water filter, with operation on dirt instead of time cycle. Rate is 1,000 gpm. (457)

Low-cost polyester filter press plates withstand temperatures up to 250F., pressures to 150 psi. They're as strong as aluminum, weigh less than one-third cast iron and cost one-third of stainless. Easy-to-handle plastic molded plates are smooth and free of pits and pores. They're chemically resistant to wide variety of corrosives. Smooth joint surfaces provide leakproof-type seal between plates and frames. (458)

**Acknowledgement:** Author expresses appreciation to the following companies for their aid in preparation of this Special Report: John C. Carlson, Ltd., London, England; Filtration Engineers, American Machine & Metals, Inc., East Moline, Ill.; Hercules Filter Corp., Hawthorne, N. J.; National Filter Corp., N. Y. C.; T. Shriver & Co., Harrison, N. J.; Sparkler Manufacturing Co., Mundelein, Ill.; and The Duriron Co., Dayton, Ohio.

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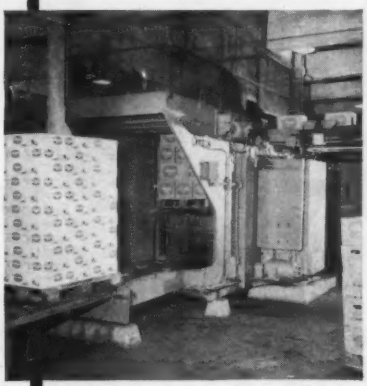

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- **Practically eliminates "thin" or "bias" cuts.**
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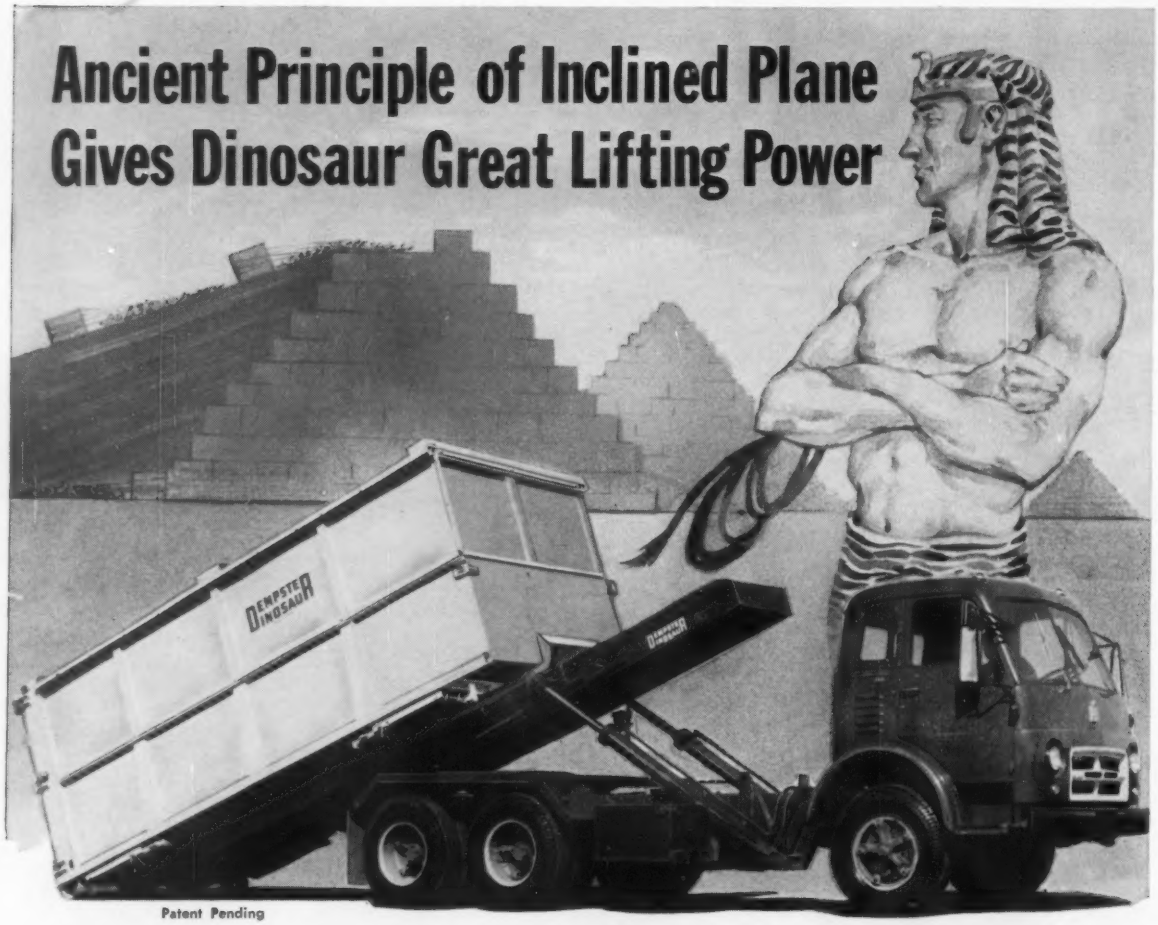
# Ancient Principle of Inclined Plane Gives Dinosaur Great Lifting Power




Patent Pending

Use of an inclined plane is one of the world's oldest lifting principles. Huge earthen ramps, timbers, rollers and plenty of slave-power are reputed to be behind the secret of lifting the huge blocks of stone into place to form the pyramids of Egypt.

The DEMPSTER-DINOSAUR uses the inclined plane and hydraulics to achieve its fantastic load-lifting ability.

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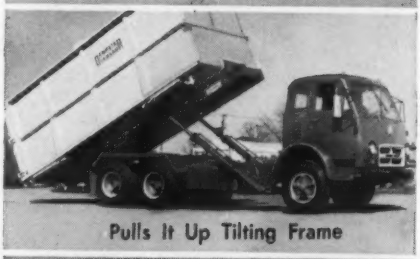
Dinosaur Engages Container



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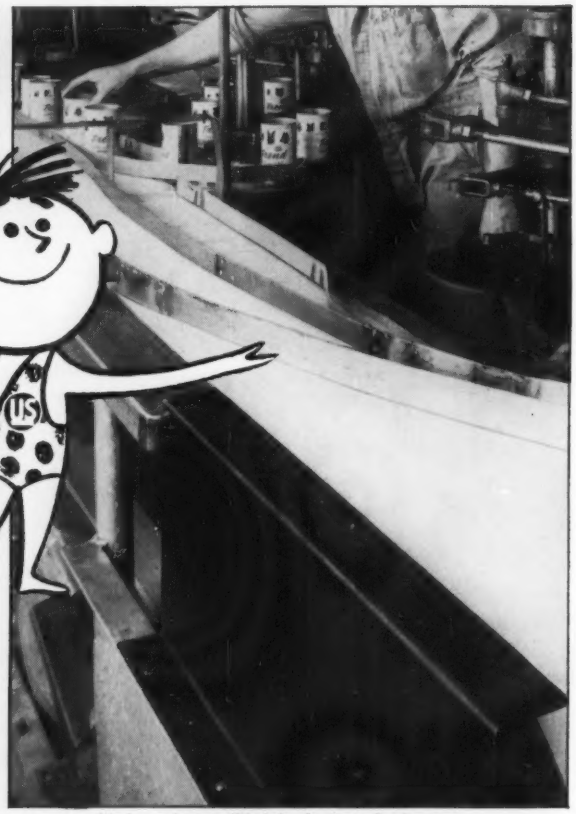
LITTLE GIANT CONVEYOR BELTS

Frankfurters being sealed, boxed and carried on the U.S. Little Giant Belt.



Worker selects a filled dog-food can for inspection. The conveyor belt is U.S. Little Giant.

# NO PRODUCTION DELAYS IN OVER 10 YEARS!

## That's the record of Little Giant® Conveyor Belts at Forst Packing Co.

MR. CHARLES FORST, president Forst Packing Co.

"It's ten years ago since we switched from stainless-steel belts to U.S. Rubber Little Giant Belts," says Charles Forst, president of Forst Packing Co., Kingston, N. Y. "We've found that Little Giant belts, so far, have lasted 4 times longer, can be lengthened or shortened without downtime production interruptions, are easily kept sanitary."

Mr. Forst has three "U.S." Belts in the frankfurter and bacon room and one in the pet-food canning section. He adds, "We find the U.S. Little Giant Belts have a flexibility that is just right for our needs. Also, the sharp edges of the steel cans do not bother the belts —but they wore out the stainless-steel belts in less than two years. *Not once have we ever had a repair problem that interfered with our production schedule.* We use Little Giant Belts exclusively."

It's cost-saving and long-life performances such as this that have induced both large and small food packers to adopt and standardize on U.S. Little Giant Conveyor Belt.

• • •

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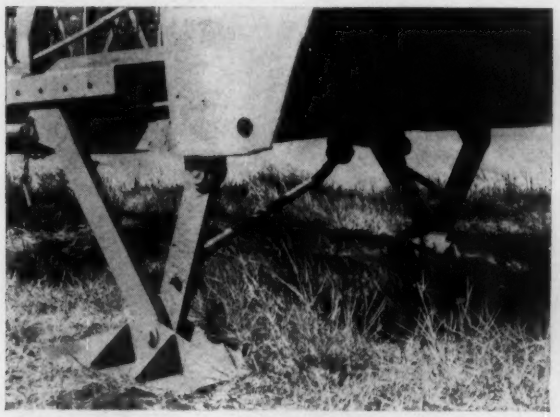
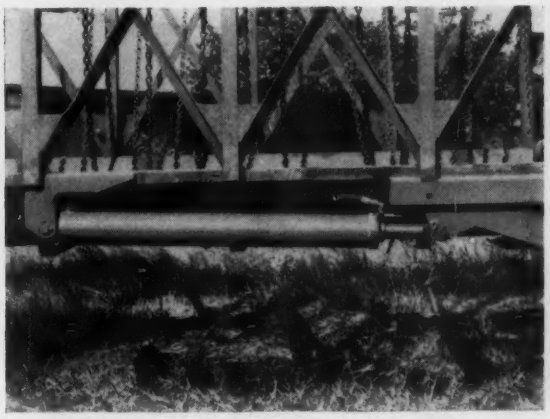
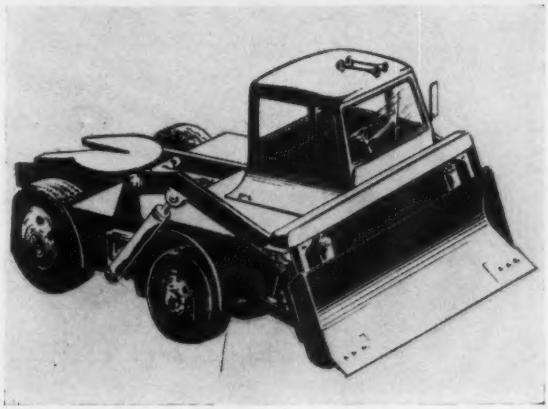






# Big Scale Materials Handling

The semi-trailer is recognized as the most economical means of transporting such raw food materials as sugar cane, sugar beets, potatoes, celery, carrots, etc. But, trailers are not widely used because: (1) They have been considered part of the expensive prime-mover (tractor) due to the time-consuming labor involved in uncoupling, and (2) even with a highway prime-mover they could not be maneuvered over rough field terrain.

Containerization, the new semi-trailer concept for cane transport, reduces hauling costs, speeds delivery to mills and obviates losses and cost of mill-yard stock piling. It incorporates two new developments: A landing gear device (top, left photo) operated by hydraulic unit (top, right) which is controlled from the driver's cab, and a new prime-mover (bottom, right) specifically designed to haul semi's over rough terrain.

Developed by Hilo Trailer Ltd., Hilo Hawaii, the empty semi is hauled by highway tractor to the fields. Then driver lowers landing-gear, parks trailer, and unplugs snap-in lines. The field mover (D-7 track-layer with 5th wheel) hooks on to the semi, raises landing-gear and hauls it to a cane loading station, where he lowers the landing-gear. When loaded cycle is reversed, with the highway tractor moving loaded trailer (bottom, left) to the mill-yard.—FE Staff.)

## Savings With Tubeless

The tubeless tire is gaining ground for small truck use and will make a significant jump on over-the-road equipment. This is largely due to relative operating economies, says K. L. Campbell, a Firestone engineering executive.

Since introduction of the tubeless, detailed cost and maintenance records have disclosed a number of advantages beyond original claims. Weight difference alone permits a payload increase of 560 lb. on a typical combination, without engineering changes. Every road delay eliminated for tire changes saves up to $32 out in the country and profitable sums in cities.

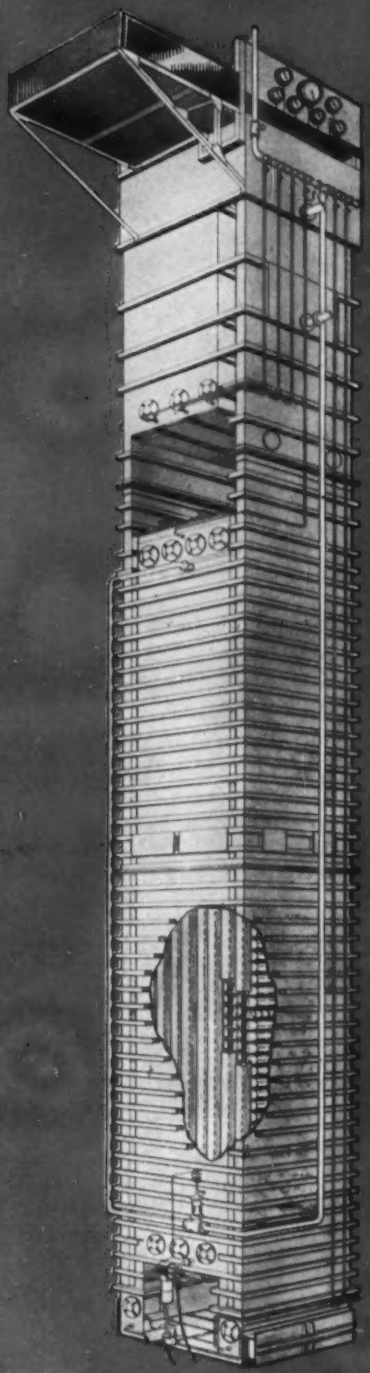
Because the tubeless tire can run miles on retained air after being punctured there is less carcass damage from running flat, therefore more recap carcasses. — *National Leasing System, Chicago.*

## PVC Pipe Solves Abrasion

In South America, freshly picked coffee beans were hydro-conveyed in galvanized steel pipes. But these deteriorated rapidly

# Now, from France, for your plant and profits

# . . . a sensational (and proved) saving step in canning!



For a long time, continuous pressure cooking and cooling presented many problems in mechanics and heat exchange. *But now, a revolution from France!* Introduced just a few years ago, the genuine CARVALLO hydrostatic continuous cooker and cooler has been constantly tested, refined and improved. Today, it is considered the finest unit in the world, matching your own product quality standards.

**Only the genuine CARVALLO hydrostatic pressure cooker-cooler gives you these exclusive features . . .**

1. **Preheating and Cooling under Integral Counter Flow** saves up to 80% in steam and cooling water.
2. **Fully Automatic Self-controlled Unit,** directly coupled to seamers and labelers or casers, saves 100% in processing labor.
3. **Specially Designed Chains** are rugged, durable. Do not stretch or wear. The end of the carriers are closed by the chains, preventing jamming and lateral friction and damage to the cans and jars.
4. **Hydrostatic Controlled Pressure** insures an absolutely constant temperature during sterilization, eliminates transfer valves and all their troubles. Pressure variations inside and outside of cans are progressive! No exploded peas! No clouded juices! No leaking seams!
5. **Tubular Carriers Unattached to the Conveying Chains** — the same unit can process, without any change parts, cans, jars or bottles in a wide range of sizes and shapes. No jamming through dented cans or broken jars. Easy automatic loading and unloading. Carriers can be removed very quickly for yearly inspection.

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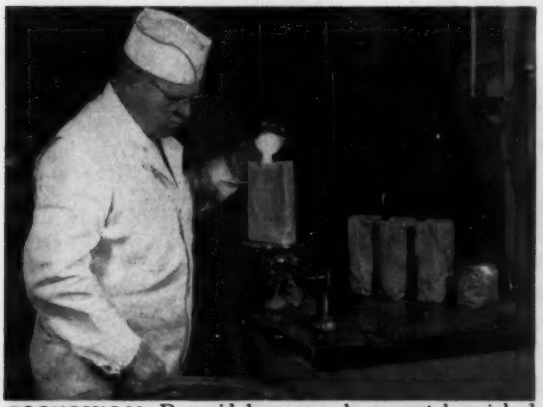
**Patented and technically directed by: Pierre CARVALLO 24, villa Dupont, PARIS 16e**

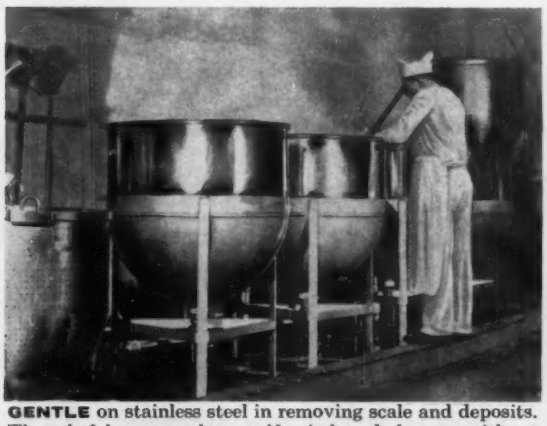
# For fast removal of scale and protein deposits from cooking vessels, pipelines, evaporators, use safer **dry acid** cleaners based on **Du Pont Sulfamic Acid**

**SAFER TO HANDLE.** These dry acid cleaners eliminate hazards of broken carboys, spattered liquids, corrosive fumes. The cleaners are dry, nonfuming powders, packed in easily handled, disposable drums.

**EASIER TO USE.** Just scoop out required amounts of dry acid cleaner and add to make up tank. Often can be added directly to equipment being cleaned . . . no elaborate equipment or specially trained labor required.



**ECONOMICAL.** Dry acid cleaners can be accurately weighed and packaged—eliminating costly overuse by unskilled employees. These concentrated cleaners, undiluted by water, save on shipping, handling and storage costs.



**GENTLE** on stainless steel in removing scale and deposits. Thoughtful personnel use sulfamic-based cleaners without fear of stress cracking or pitting of expensive equipment so easily induced with hydrochloric acid.

Ask your supplier for safer, effective cleaners based on Du Pont Sulfamic Acid, or mail coupon for additional information and names of formulators who offer these compounds.

E. I. du Pont de Nemours & Co. (Inc.)
Industrial & Biochemicals Dept., N-2553FE
Wilmington 98, Delaware

Please send me ☐ sulfamic acid general equipment cleaning bulletin; ☐ names of formulators offering cleaners based on sulfamic acid.

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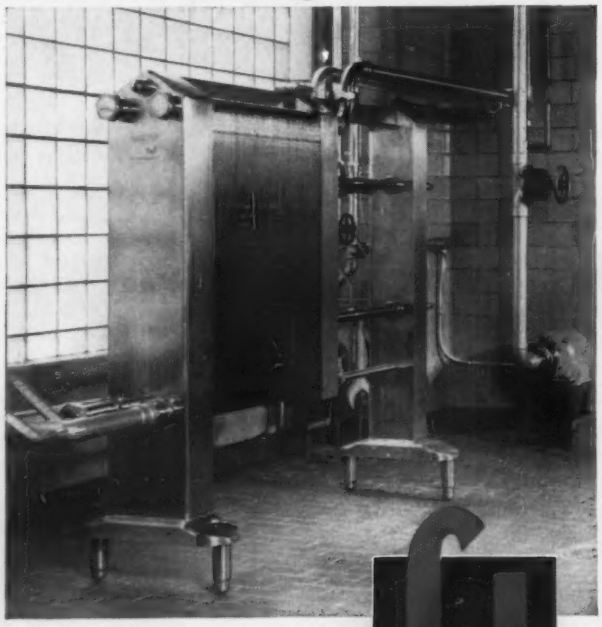
Circle 71 on READER SERVICE CARD 71

# Low-Cost Cooling* Assured



*

Chester-Jensen Plate Heat Exchangers
Heat
Cool
Regenerate

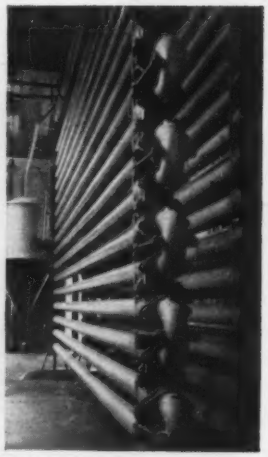
AT the famous brewery of D. G. Yuengling & Son, "Brewers Since 1829," in Pottsville, Pa., it was desired to reduce the cost of cooling wort to the absolute minimum . . . and so the double-pipe wort cooler shown at right below was replaced with the Chester-Jensen Plate Heat Exchanger shown above. Result:

**50%** **Reduction in cooling time,** using chilled water only instead of water and brine.

**50%** **Reduction in refrigeration load** (37°-38° chilled water to cool 180°-190° wort to 50° at 208 bbls./hr.)

**92%** **Reduction in floor space** occupied by cooler. (Installation released some 600 sq. ft.)

Chester-Jensen Plate Heat Exchangers can heat and/or cool . . . often largely by regeneration . . . almost any pourable, homogeneous liquid with comparable economy . . . often achieving still higher efficiencies. Write for information on *your* problem.



*Chester-Jensen Equipment Is Built Entirely In U.S.A.*

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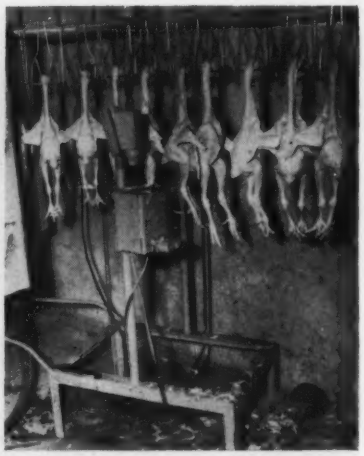
## *Practical Ideas*

from severe abrasion produced by the slurry. External corrosion was also a factor.

When the steel pipes were replaced with polyvinyl chloride pipes (Buyers PVC) both problems were overcome.



### Portable "Eye" Counter

Few pieces of equipment in a poultry plant escape being sprayed with high-pressure streams of hot water during daily clean-ups. Electronic equipment is especially vulnerable to this treatment.

At Armour and Co.'s new Turlock, Calif., plant, each lot of poultry is electronically counted. The eye and its light-beam are placed on vertical standards, fixed to a 2-wheel, mobile wheelbarrow-like base (photo). When processing ends, unit is disconnected and wheeled to a safe area where clean-up is not required.—(FE Staff.)

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# A Reliable Way to Judge a COPPER TUBE Piping System

## . . . Look for this Mark JENKINS of Quality Control

Jenkins Bros

Surest kind of assurance that it is a QUALITY installation is given by the famous Jenkins "Diamond" on valves controlling the lines.

Where "anything will do", you're not likely to see Jenkins Solder (or Socket) End Valves. But you can expect to find them on jobs handled by engineers and contractors who know an economy installation is one you can forget.

*Compare* Jenkins Solder End Valves with any others. You'll see why they are trusted to give a lifetime of reliable service with a minimum of attention.

*Note* the thick, smooth bore solder-joint ends that withstand heating and contribute to a quick, leak-proof connection. Look inside at the many Jenkins superiorities in design and construction.

*A complete line* of top-quality Jenkins Solder End (and Socket End) Valves is available from your local Jenkins Distributor. Ask him to show you a sample of the type you require.

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Whether you need a little or a lot, there's always a nearby ample supply of Miles Citric Acid, U.S.P. No waiting. No fidgeting. A phone call starts your order on the way.

And it is from a new (but experienced) source . . . Miles Chemical Company, a division of Miles Laboratories, Inc. Miles has been in the citric acid business for more than a decade. But until recently, the entire output was tagged for Miles' own pharmaceuticals.

Now the capacity of our unique deep-fermentation process has been boosted so there's plenty of this notably pure, high-quality citric acid to go around.

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*HOERNER-DESIGNED CORRUGATED SAMPLER TRAY HELPED GAIN*

# 2500 NEW DAIRY FOOD CUSTOMERS

Rochester Dairy, Rochester, Minnesota, came up with a unique program for getting their dairy products used in the homes of prospective customers . . . a sampler tray containing each of the products processed by the dairy. The driver-salesman presented a tray to each prospect on his route.

The problem was to obtain an economical tray that was attractive and could hold all the products sold by the dairy.

A Hoerner Packaging Engineer* was called in. He worked with Rochester Dairy personnel and solved the problem by designing the corrugated tray pictured above. All the dairy's products, plus a sample of eggs were presented in the colorful Hoerner corrugated sampler tray.

## DID THE IDEA WORK?

As a result of this promotion Rochester Dairy opened up 2500 new dairy food accounts! It's another example of the versatility of the Hoerner Packaging Engineer in the field of specialty design.

## HOW A HOERNER PACKAGING ENGINEER CAN HELP YOU

If you package things — or if you have a packaging design problem, call the Hoerner plant nearest you. A Packaging Engineer will study your operation without obligation. He can increase your profit margin by giving economical, practical help in reducing packaging costs. All through improved packaging with corrugated. Call today.

**The Packaging Engineer responsible: L. H. Hildebrandt.*

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***Corrugated Specialists for Mid-America***

**GENERAL OFFICES:** 600 Morgan St., Keokuk, Iowa. **PLANTS:** Keokuk, Des Moines and Ottumwa, Iowa; Sand Springs, Oklahoma; Minneapolis, Minnesota; Fort Worth, Texas; Sioux Falls, South Dakota; Fort Smith and Little Rock, Arkansas; Springfield, Missouri; Tupelo, Mississippi. **ASSOCIATE:** Cajas y Empaques Impermeables, S.A., Mexico City D.F., Mexico

INERT GAS generator produces 200 cu. ft. of gas per hr. from natural, propane or butane gas. According to "Federal Register" (4-22-60, para. 121.86) use of such gas is permitted with non-standardized food products.—Vitagen Corp., Los Angeles. (463)

UV SPECTROPHOTOMETER with visible recording; double beam, double-grating. It directly records transmittance, absorbance, reflectance and emission throughout UV and visible ranges, 200 MMU - 700 MMU. Low cost of unit places it within range of most laboratories.—Bausch & Lomb Optical Co., Rochester, N. Y. (462)

FREEZE-DRY lab unit with 2½-litre condensate capacity, vacuum (pump) down to 20 microns. Maintains uniform temperature (plus-minus 1 F.) down to minus 45 F.; uses Freon 22. Unit has 6½ in. high x 12 in. square chamber. — American Sterilizer Co., Erie, Pa. (466)

# Advances Seen at IFT Show

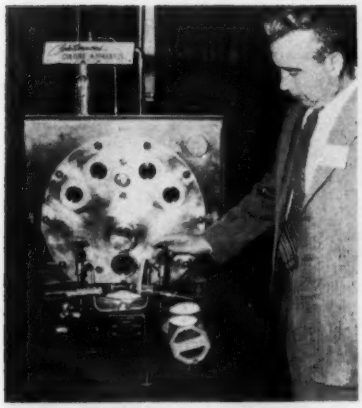
## Analytical instruments, quality control devices, and process units exhibited. "Instant" bread demonstrated

UV, VISIBLE SPECTROPHOTOMETER (left) is low-cost, double-beam unit for qualitative, quantitative measurements. Shown to right are: Chloride ion analyzer that automatically determines ion concentration in aqueous solutions over range from 0.1 to 10,000 ppm. New pH meter with expanded scale and high pH sensitivity. UV spectrophotometer and potentiometric recorder.—Beckman Instruments Div., Fullerton, Calif. (468)

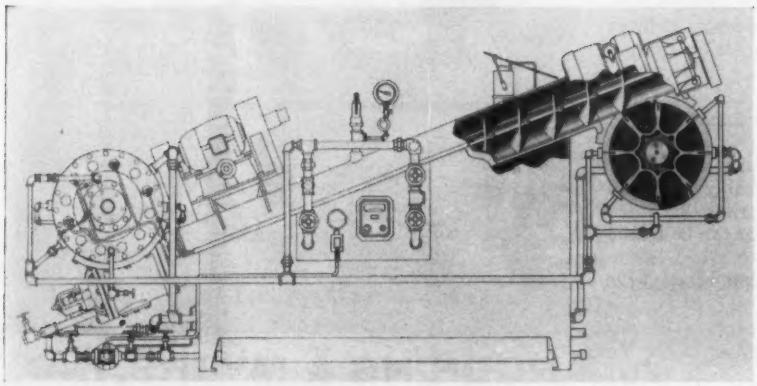
ELECTRONIC RECORDING Shear Press has three circuits for three pressure ranges (0-300 lb., soft; 0-1000 lb., medium; 0-3000 lb., firm). It records texture-rheological measurements of raw to finished products. Provides control for process functions.—Comptroller Electronic Shear Press. (461)

IN-STREAM, continuous reading instrument determines total soluble solids of all liquids, including turbid, dark-colored concentrates. Critical accuracy is ¼° Brix for most products; ½° Brix for liquids containing fat.— Goldberg Process Refractometer. (460)

ELECTRONIC DETECTOR safeguards foods against metallic particles (steel, brass, copper, aluminum, stainless, monel) as small as 0.039 in. Unit can actuate warning signal, light or rejection gate, or momentarily stop flow. It is waterproof and can be hosed down.—Radio Corporation of America, Camden, N. J. (467)



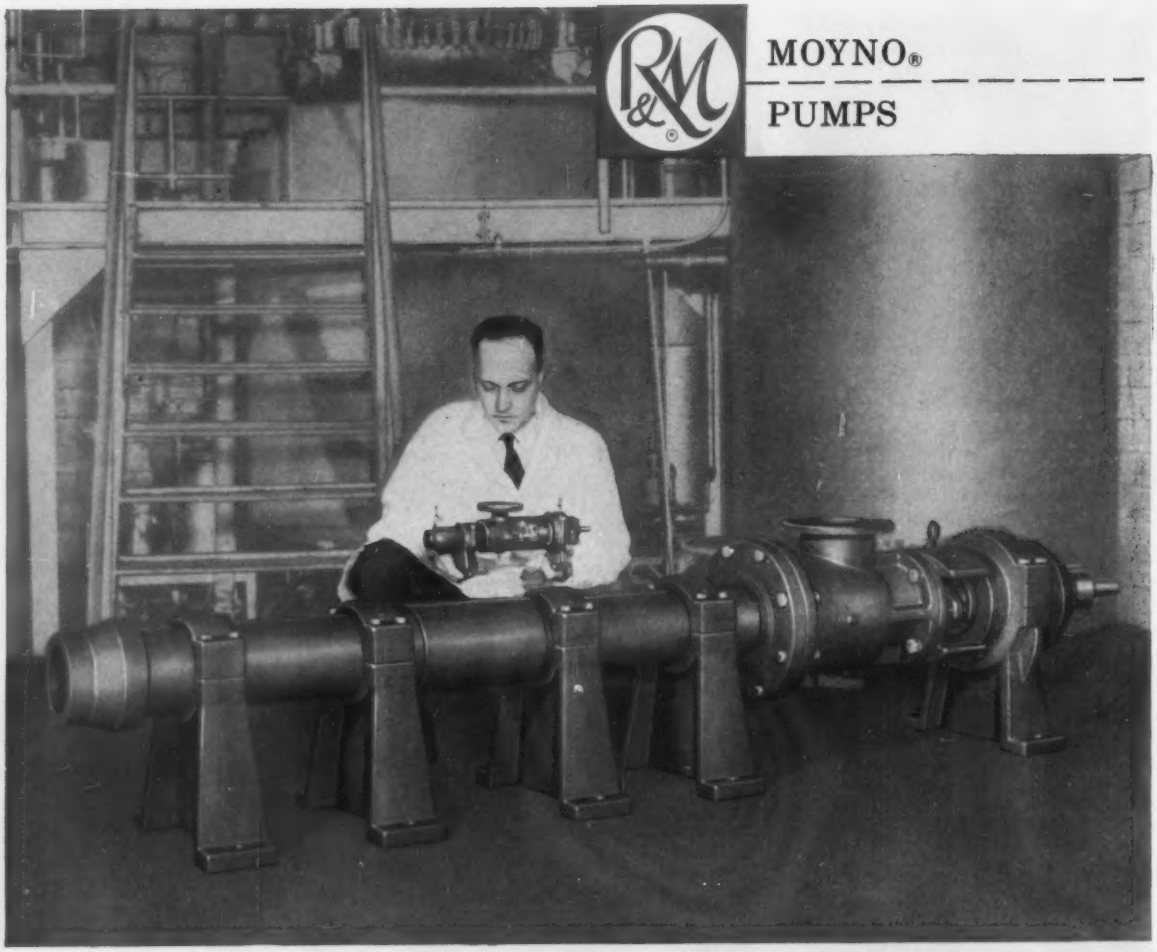
CONTINUOUS quality culturing rapidly produces large quantities of specific organisms under defined conditions. Physiological state and concentration of chemical constituents in medium remain constant. — American Sterilizer Co., Erie, Pa. (465)



INSTANT BREAD is made in 45 minutes instead of the normal 5-6 hr. Special ingredients in the formula, to give aroma and taste of fresh bread, were developed by Arthur D. Little, Inc., for U. S. Army Quartermaster Food & Container Institute. The mix requires only addition of water and mixing. Product was demonstrated at press conference. (469)

COOKING-PEELING unit utilizes pressures to 120 psig. and temperatures to 350 F. Special valve is used to precook cereals and peel root type vegetables.—Food Machinery Corp., San Jose, Calif. (464)

***For more information, circle key numbers on Reader Service card at back of book.***



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PUMPS

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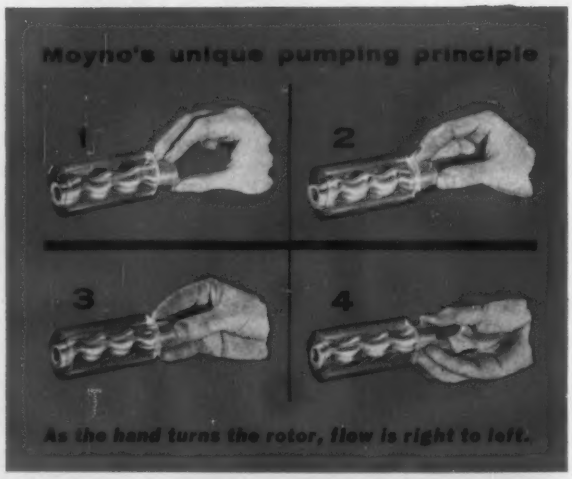
***pressures: up to 1000 psi***

MOYNO pumps are available in nine sizes with capacities ranging from minimum metering flow to 500 gpm and pressures from zero to 1000 psi. Positive displacement delivers uniform discharge without pulsation, agitation or turbulence. Solutions ranging from thin watery slurry to extremely viscous paste, corrosives, abrasives and even solids in suspension are economically handled without excessive pump wear.

MOYNO's unique *"progressing cavity"* principle with only one moving part and special resistant internal parts slashes pump maintenance costs on problem materials that often ruin other pumps. Almost any substance that can be forced through a pipe can be pumped by a MOYNO.

To learn how a MOYNO can cut your pumping costs, write today for Bulletin **30-FE**

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# New Findings on Dehydration

**Researchers develop techniques to improve foam-mat drying, dehydro-freezing of apples, and processing of potato granules**

NEW TECHNIQUES to improve drying operations were reported at the annual meeting of the Institute of Food Technologists, in San Francisco. Researchers have come up with refinements in foam-mat drying, dehydro-freezing, and potato dehydration. Research since the announcement last fall of USDA's new "foam-mat" method for instant food powders has reduced drying time and increased dryer capacity, reported A. I. Morgan, Jr., USDA, WURD, Albany, Calif.

Foam-mat drying consists of whipping a liquid food to which a foam stabilizer has been added, spreading the foam on a surface, and drying it in a warm air stream. The dried foam is crushed to a powder.

In the new "crater" method, the stabilized foam is spread on perforated metal trays. Air forced upward through the perforations distorts the foam mat into crater-like contours. During drying, warm air flows through the perforations. Area exposed to drying air is several times greater than that of the smooth mat of foam used earlier.

Advantages in addition to faster drying and increased dryer capacity are:

1. Dried product is easily removed from trays, and the trays are reused without washing.
2. Metal trays are more durable than the plastic-coated belt previously used.
3. Continuous, automatic loading of trays is possible.
4. A two-stage process makes for efficient operation. In the first stage, air at about 200 F. moves through the trays in the direction of tray movement. In the second stage, air at lower temperature moves countercurrently to movement of trays.

About ½ lb. of dry product (2% moisture) per square foot of tray per hour can be expected.

## Apple Dehydrofreezing

The partially dried, frozen product is commercially produced to a moderate extent. It offers savings of 50% in weight and space and appropriate control of water added when used in pies or other manufactured foods.

The engineering studies (presented by M. E. Lazar, USDA, WURD, Albany, Calif.), show that through-flow drying is more effective than the previously used cross-flow. The studies also provide information for use in solving problems associated with sulfur dioxide treatments used to prevent darkening of slices.

Since only 3 to 10% of the sulfur dioxide in treated fresh slices remains in dehydrofrozen apples baked in pies, levels higher than previously established can be used in processing. With levels as high as 400 ppm., drying air with high humidity is not required to control penetration into the slices in the new method.

The use of steam blanching before the sulfured, partially dried slices are frozen produces slices so pliable that 25 to 35% more can be packed into a container. In addition, blanching precludes any possibility of dark centers due to inadequate penetration of sulfur dioxide.

Unsulfured dehydrofrozen apples can be made from fruit treated with salt and citric acid. Drying temperature, however, must be mild, and blanching must follow partial dehydration of the product without delay.

## Potato Granule Process

Research workers in USDA's laboratory in Albany, Calif., have developed new techniques for potato granule manufacture that eliminate "add-back" and yield high-quality products.

So-called "add-back" process is the presently used addition of already dried granules to cooked potatoes in the initial drying stage. Only a portion of the dried material is removed as product. The remainder is recycled. Add-back reduces the high moisture content of mash with minimal cell breakage and minimal release of free starch. This reduces pastiness in the product when prepared for serving. Use of add-back means, however, that the product has been moistened and redried about 8 to 12 times.

## Low-Temperature Cook

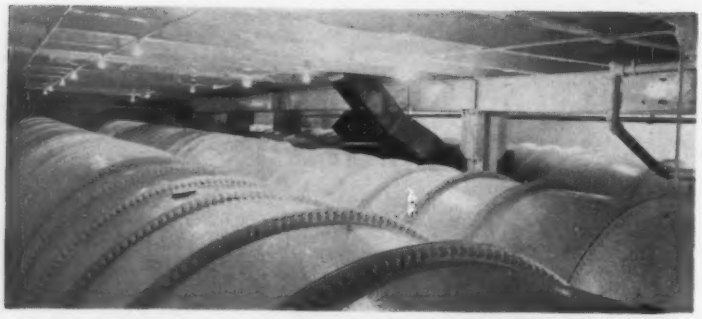
Research on new techniques, reported by C. E. Hendel, USDA, WURD, includes low-temperature cooking of fresh potato slices, conditioning of the slices at low temperature, and partial drying and granulation in new-type equipment.

Slow cooking of slices (at 185 to 190 F.) apparently tends to produce an open structure in the starch. This open structure continues through dehydration and increases the moisture-absorbing capacity of the final product. The slow cook also improves the texture of mashed potato prepared by reconstituting granules with boiling water. Soaking fresh slices in water before cooking also helps to achieve the same improvement.

## Eliminates Add-Back

Properly conditioned cooked potato enters the drying system directly, making use of add-back unnecessary. In the new granulating - drying equipment rotating blades gently disintegrate the potato on a moving belt or in a trough, as a warm air current lowers moisture content. The mild compressing and shearing action imparted is essential to the success of the process.

Alternatively, the moisture content can be reduced to about 55% on a drum drier, the product "conditioned" at room temperature or below, and further drying carried out in the granulator dryer. Final drying, from 35% moisture down, can be done in shaker and fluidized-bed dryers as in the add-back process. (End)



OLD TANKS in brewery cellar were made "good as new" by filling joints, buffing, removing damaged linings, applying thermosetting resin.

# Epoxies Fix Old

NEW TANKS were fabricated in winery cellar by welding carbon steel plates, covering inner surfaces with epoxy, cleaning and priming exteriors.

# —Build New

**Versatile plant-applied coatings are true double-action agents—equally efficient for glass-smoothing old, worn and damaged tank linings or setting up new ones**

HIGH COSTS of maintaining storage tanks, and difficulties encountered when replacing them or installing new ones have posed thorny problems for operators of breweries, wineries, and many other food processing plants.

## Resin Coating Cuts Cost

Now, however, a method has been perfected for applying baked resin coatings right in the plant. This enables complete restoration of damaged vitreous or glass linings. It also makes possible fabrication of new storage tanks from carbon steel sheets at the installation.

Coating is an epoxy formulation (Lastiglas) that is resistant to corrosion from alkalis and acids. Its application involves a multiple-coat process. Each coat is hot-sprayed on and set with heat. Final coat receives a special high-temperature cure.

Resulting lining is hard, glass-smooth, and tough enough to resist normal usage. The surface affords no adhesion for organic material and, in most cases, will flush clean with water.

## Careful Preparation Essential

Tanks are prepared for coating by removing all of the original lining. In case of sectional tanks, seams are covered with steel strips, which are welded to them. The entire tank is tested for pressure seal.

With horizontal cylindrical tanks where clean bottom drainage is required, sectional joints are filled with welding rods that are ground smooth and flush with tank bottom. Entire interior is then sand blasted to bright metal, and the tank thoroughly vacuumed. Lining is applied as described above.

Recent projects at Duquesne Brewing Co., Pittsburgh, and Jackson Brewing Co., New Orleans, involved this type of renovation. At Duquesne 16- and 18-ft. sectional tanks were welded together to form units 50-60 ft. long to increase storage capacities (top photo).

Further, at Chateau Gai Wines Ltd., Niagara Falls, Ontario, 17 round, vertical 20,000-gal. tanks were recently field-erected in a new cellar (left photo).

Here, to provide the most sanitary units, interior stiffening was eliminated. Carbon steel sheets were butt-welded on both interior and exterior. After erection, interior welds were buffed smooth and entire inside surface was sand blasted to bright metal.

After application of each coat of the resin, lining was checked with a magnetic gage to establish uniform thickness. Then a careful inspection was made for rough spots or other imperfections. These areas were hand-sanded before the next coat. Successive coats were applied until desired thickness was obtained.

Special stainless steel manways were installed to provide access to the tanks for easy cleaning. Negligible tartrate buildup on the lining practically eliminates cleaning problems. To complete the job, exterior surfaces of tanks were sand blasted and primed.

Engineering, fabrication, installation, and coating of tanks were by Bishopic Products Co., Cincinnati. (End)

# Pre-Kill Injection Tenderizing Revealed by Swift

**New technique also reduces handling, cuts shrinkage, realizes more poundage per carcass . . . Special equipment employed . . . Test-market retailers credit treated meat with upping sales 25%**

STRIKING PERFORMANCE with a new technique of meat tenderizing is reported by Swift & Co.

Briefly, the method involves treatment of steers with a special fruit-based liquid tenderizer that incorporates the enzyme papain. This solution is injected intravenously into the livestock 8 to 10 min. prior to slaughter. Thus, the animal's own circulatory system distributes the enzyme through its body.

Amount employed depends on the steer's weight, rising with heavier animals. For an average steer, 8 oz. is used.

As well as the notable gains in tenderness; these additional advantages are cited—

► **Treated meat may be stored and handled exactly like any other meat (although solution is injected before slaughter, it doesn't begin tenderizing action until the subsequent meat product reaches cooking temperature).**

► **Plant holding time is reduced to a mere 1 to 2 days' period—tenderness associated with aged beef being achieved when the meat is cooked.**

► **Prevented are shrinkage losses and discolorations associated with conventional aging processes.**

► **More poundage per carcass is realized in the market through trim savings.**

Resultant tenderized beef is trade-named ProTen by Swift. The system was developed over 5 yr. in a project directed by Dr. H. Robinson, v.-p., research, and it has been approved for use by USDA under the Meat Inspection Act. It is protected by a U. S. patent (No. 2,903,362). Similar patents have been granted in Canada and in several other countries.

Degree to which meat is tenderized, says Swift, depends not only upon the amount of the injection but also on length of time the meat is ultimately cooked. Of the two factors, however, the amount of injection is called most significant in controlling tenderness. Extensive tests, reports the company, have resulted in an optimum injection schedule according to weight of animal.

**Prime achievement is that the system permits consumption of beef cuts that previously were considered too tough. And consumers can change cooking to some extent. For instance, a chuck roast can be broiled or fried, instead of moist-cooked. In some cases, cooking time is reduced.**

A Swift source says that although papain is employed exclusively now, any one of several other proteolytic enzymes can be used "equally well."

**Further, though the accent is currently on beef, the technique may also be employed on pork and lamb.** These, however, are more tender meats, hence the need is not so great.

## Requires Special Equipment

It is pointed out that specialized injection apparatus has been developed, and that personnel involved in the work are carefully trained for carrying out the technique.

To date, however, Swift has not released the details of the equipment or pictures, commenting that "while we are now past the research phase, we are still proceeding with what might be called market research." In short, the system awaits official finalizing out of the "pilot" stage.

Nevertheless, two Swift plants have bustled for 2 yr. with the job of turning out ProTen meat. They are the plants at Ocala, Fla., and St. Joseph, Mo. The meat they process is sold with a package-insert label stating that the meat has been injection-treated and describing most advantageous ways of cooking it.

It's reported that five more Swift packinghouses will begin supplying the ProTen meat in the next few months: Fort Worth, Tex.; Toronto, Can.; Broderick, Calif.; Montgomery, Ala., and East St. Louis, Ill.

The treated meat thus far turned out is being sold only through local stores—no large national chains.

## Hailed in Market

According to reports from the test markets, consumer response and acceptance have been highly satisfactory. The company interprets these checks as indicating that the new technique will make beef more popular than ever with consumers through widening varieties of tender cuts and increasing grades that can be simply broiled or roasted.

In these trial markets, specific retailers cite savings on trim and thus far haven't raised the prices to consumers. A 5% up, roughly translating to 2¢ a lb., is charged by Swift to cover the treating process.

Under the new system, Swift can kill cattle one day, chill carcasses an additional day or two, then ship immediately — saving considerable time from the old lagging slaughterhouse-to-retailer routine.

**Stores handling the ProTen meat credit it with sparking jumps in beef sales running 25% and more over past performance.**

They say that customers all along the line have volunteered comments on the excellence of the more-tender treated meat. Only criticism reported is that—paradoxically—it has sometimes seemed a bit too tender. (End)

## *Recommended Reading for*

# FOOD PLANT ENGINEERS

Engineer Phil Brown had a problem: A food processing operation in his plant was being expanded, necessitating rearrangement of existing units and installation of new equipment. New pipelines had to be provided to convey liquid and semi-solid foodstuffs—and time was at a premium! Down time had to be held to an absolute minimum, so the changeover would have to be made fast. But conventional piping installations take time . . :

So Phil dug out his copy of Tygon Tubing Bulletin T-100, and verified the fact that this versatile piping medium could solve many of his liquid food transmission problems—and solve them faster and more economically.

He found, for example, that Tygon Tubing can be installed quickly in long continuous runs without joints or couplings, and its extreme flexibility makes it adaptable to any layout. He learned that it is completely non-toxic—safe for even the most sensitive foods—and resistant to all food acids and alkalies. He liked its glass clear transparency which permits instant visual inspection of flow, and the fact that it can be disassembled and cleaned or steam sterilized in minutes.

Now Phil has the problem well in hand. At the moment he is referring to Bulletin T-100, selecting his requirements from the many types of Tygon Tubing (including vacuum and pressure types), and from the wide range of bore sizes—from 1/32″ to 4″ I.D.

Why not ask for *your* free copy of Bulletin T-100 today?

**TYGON**

**PLASTIC TUBING**

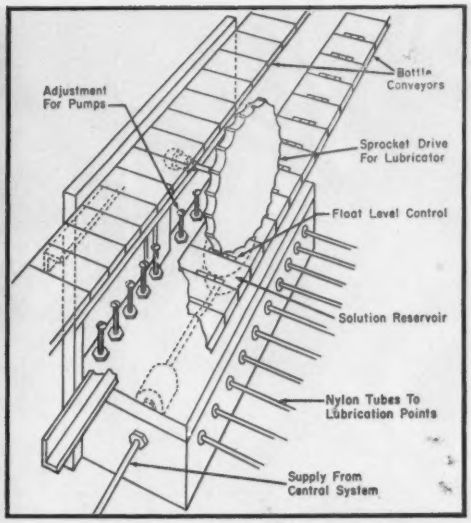
PLASTICS AND SYNTHETICS DIVISION

226E-2

**U. S. STONEWARE**

AKRON 9, OHIO

**SOLUTION SUPPLY CENTER.** Gel-type soap is charged into left drum to prepare concentrate. Latter is diluted in right drum for distribution.




**DISPENSING UNIT** feeds correct amount of solution to 10 points.

# Cuts Chain-Lubing Costs

## New central system automatically applies soap solution of uniform concentration to 10 or more points in bottle-conveying system

MARKED SAVINGS in soap consumption, reduction in wear of conveyor chains, and improved sanitation are some of the benefits resulting from installation of a "central lubrication package" in the bottle shop at Pabst Brewing Co.'s Newark, N. J., plant.

The new system obviates both the need for manual dilution of soap and the filling of the individual dispensers previously used to lubricate bottle conveyors. It automatically feeds the correct amount of soap solution to each conveyor, and cuts off flow when conveyor stops, thus reducing waste and minimizing accumulation of unsightly soap suds on the floor.

Developed by DuBois Co., Cincinnati, the "package" consists of two elements: (1) The central system, which automatically prepares soap solution of predetermined strength, and (2) the Administrator equipment for applying solution to each lubrication point. The former continuously feeds to the latter.

The equipment provides positive and adjustable feed. It automatically stops and starts dispensing in synchronization with the stopping and starting of the conveyor system. And it handles a number of lubrication points in a given area, or on a given conveyor.

It contains a bank of 10 piston pumps operated in unison by a cam arrangement. Piston stroke of each pump is adjustable, thus enabling different feed rates to as many as 10 separate chains. Pumps all draw solution from a single float-controlled reservoir that is kept filled from the central system.

The central system comprises two 55-gal. open-head drums (concentrate and controlled-dilution reservoirs) complete with float controls, water feed, and overflow piping (photo). In addition there are the electronic controller, circulating pump, and pipelines.

Concentrate reservoir is designed to handle soap in gel form. It is supplied with water by a solenoid valve that is actuated by the electronic controller. Dilution reservoir receives concentrated soap solution from 1st tank and mixes it with fresh water to produce solution of desired strength for lubricating the chains. This solution is circulated through the system to keep the distribution reservoir filled, also to insure thorough mixing in the dilution drum.

As solution is used, level in dilution tank falls, causing float valve to open and admit fresh water until level is raised to desired point. This reduces concentration of soap in the solution. When it drops below a certain point, as measured by electrodes in the drum, electronic controller opens solenoid valve in concentrate reservoir. This allows water to enter, and causes concentrated soap to overflow into 2nd drum and build up strength of solution in it. Then solenoid closes and flow from 1st drum stops.

If supply of soap in concentrate reservoir should become exhausted, strength of solution in 2nd drum will continue to drop. At a predetermined level, a second circuit in electronic controller turns on a red light and actuates a buzzer.

As a further safeguard, concentrate reservoir is equipped with a safety float valve that prevents addition of water to the point where drums would overflow.

(End)

# B.F.Goodrich belt fights moisture that rots other belts

**B.F.Goodrich "Green Pack" belt resists moisture, mold, fungi**

THAT B.F.Goodrich belt has three times the moisture resistance of other belts used in the food processing industry. At the plant shown above, this BFG belt carries wet, diced celery. Belts previously used here were a problem. Water soaked into the belt, weakened and rotted the fabric reinforcement. Moisture also encouraged the growth of mold and fungi.

To protect against moisture, B.F.Goodrich engineers developed a special treatment for conveyor belts called "Hydroseal". This treatment is applied to the fabric reinforcement, where it penetrates every cord, giving maximum resistance to moisture. Each of the fabric plies is also coated with rubber for additional protection.

This improved B.F.Goodrich belt is more sanitary, too. It's made with a special rubber compound containing an inhibitor that resists most fungi and molds, keeps them from forming on the belt cover.

Food inspection is easier, more accurate because of the belt's light green color. The color is used throughout the belt, cannot fade or be rubbed off. Belt surface is extra smooth, so it won't trap dirt, is easy to clean.

B.F.Goodrich was the first company to have its conveyor belts found suitable by the Food and Drug Administration for safe food handling under the new Food Additives amendment. For more information on any of the B.F.Goodrich products developed for handling food, call your BFG distributor or write *B.F.Goodrich Industrial Products Co., Dept. M-877, Akron 18, Ohio.*

**B.F.Goodrich**

**CONVEYOR BELTS**

# More Additives Get Extra Time

## Extensions Also Listed for 2 Radiation Sources

ADDITIONAL tabulations from FDA specify grace periods for another 22 additives. A few of these fall in the 'direct' category, but most are 'indirects' related to packaging.

The month also saw FDA grant more time for use of two sources of radiation, as applied in inspection, packaging, and process control work.

For earlier listings, readers are referred to FE Jan., p. 81; Feb., p. 19; Mar., p. 89; Apr., p. 99; May, p. 77; and June p. 85.

### Grant Grace Periods For Ray Elements

Further time has been granted covering uses of two sources of radiation in food operations—as in inspection and packaging, also relative to control of processes.

Conditions have been specified to insure against incidence of radioactivity or deleterious changes in the foods.

The listings are as follows:

**Sealed sources of radiation from radioactive isotopes (strontium 90, cesium 137).** Specified uses or restrictions: At energy levels not exceeding 2.2 million electron volts for inspection of foods, food packages, and control of food processes.

**X-radiation.** Specified uses or restrictions: Energy level of 300-kilovolt peak for inspection of foods, food packages, and control of food processes.

### Other Extensions

Additional extension of a year for a long list of flavoring substances and natural substances used in flavors was granted by FDA announcement in the June 15 issue of the "Federal Register."

And similar time extension was allowed for a list of other types of food additives, with limits on the amount and with specified uses and restrictions.

### 5 'Directs', 17 'Indirects' Put on Carryover

In recent listings, FDA has given added time (1 yr. from Mar. 6, or until earlier decision on final tolerances or denials) for employment of 5 more 'direct' additives and 17 more 'indirect' ones.

The latter pertain mostly to packaging. And while a number of them may not actually migrate to foods, they nevertheless are tabulated pending completion of additional scientific checks.

Here are the listings:

| DIRECT ADDITIVES | SPECIFIED USES OR RESTRICTIONS |
|---|---|
| 3,5-Diiodosalicylic acid | 300 ppm. in feed-grade salt for animal use. |
| Mannitol | If an amount of the food that may reasonably be consumed as an average serving contains 2.5 grams or more of mannitol, label shall bear statement of number of grams in such average serving. Average serving shall be expressed in terms of a convenient unit or units of such food or a convenient unit of measure that can be readily understood and utilized by purchasers. Label shall also bear statement that consumption of more than 7.5 grams of mannitol at one time or more than 20 grams per day may have laxative effects. |
| Methyl formate | In raisins or currants as a residue from use as a fumigant, applied at a rate of 0.77 milliliter per pound of fruit. |
| Sorbitol | If an amount of the food that may reasonably be consumed as an average serving contains 5 grams or more of sorbitol, label shall bear statement of number of grams in such average serving. (See mannitol listing, above, relative to expression of average serving.) Label shall also bear statement that consumption of more than 15 grams of sorbitol at one time or more than 40 grams per day may have laxative effects |
| Starch, oxidized, prepared by treating starch-water suspension with sodium hypochlorite and hydrogen peroxide. | As an ingredient and stabilizer in prepared foods. |

| INDIRECT ADDITIVES (a) GENERAL LIST | SPECIFIED USES OR RESTRICTIONS |
|---|---|
| Damar resin (natural East Indian resin) | As a component of films for food packaging. |
| Dibutyl phthalate | Do. |
| Dimerized resin (made from rosin—wood, gum, or tall oil rosin or blends of these—using sulfuric acid as a catalyst). | Do. |
| Dimethylcyclohexyl phthalate | Do. |
| Hydrogenated castor oil phthalate | Do. |
| Itaconic acid, polymerized | Do. |
| Maleic anhydride rosin ester | Do. |
| Nylon resin (polyhexamethyleneadipamide) | In food handling equipment other than for milk. |
| Nylon resin (polyhexamethylenesebacamide) | Do. |
| Nylon resin (copolymer of hexamethyleneadipamide and hexamethylenesebacamide). | Do. |
| Palmityl stearate | As a lubricant in polystyrene for food packaging. |
| Polysorbate 80 (polyoxyethylene "20" sorbitan monooleate). | Not to exceed 1.48% in film wraps for fruits and vegetables. |
| Sodium dodecylbenzene sulfonate | As a component of films for food packaging. |
| Sodium lauryl sulfate | As a component of food-packaging material. |
| Sperm oil, hydrogenated | As a lubricant in polystyrene for food packaging. |
| Toluene-sulfonamide formaldehyde resin | As a component of films for food packaging. |
| Triethylene glycol | Do. |

*Task-Designed* Crown lug caps—the only lug caps to give you the benefits of live rubber rings—please processors, retailers and their customers. Lug caps with live rubber rings spin on quickly, and the live rubber stands up under sterilization steam. Resilient live rubber keeps its "bounce"—and its sealing efficiency—even after long periods of warehouse stacking. Housewives like the ease with which they can remove and replace these versatile caps.

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## Esters Good Substrates For Antioxidant Checks

Antioxidants for protection of fats are commonly tested by their ability to slow down peroxide formation at 140-250F. in lard, although other fats or distilled methyl esters are sometimes used.

There is some doubt about the validity and usefulness of high temperature tests. But a "starter" of some kind is necessary to stimulate oxidation at ordinary temperatures. Here, oxidized esters of the fats proved to be useful, and unoxidized esters of cottonseed, linseed, and cod-liver oil fatty acids, were good substrates for tests carried out at 98 and 123F.

Results are obtained in 10-20 days with best antioxidants, and are expressed as the "protection factor." This is the ratio of number of hours required to reach peroxide value of 100, 25, or 10 for the ester treated with an antioxidant, to the number of hours for the untreated control.

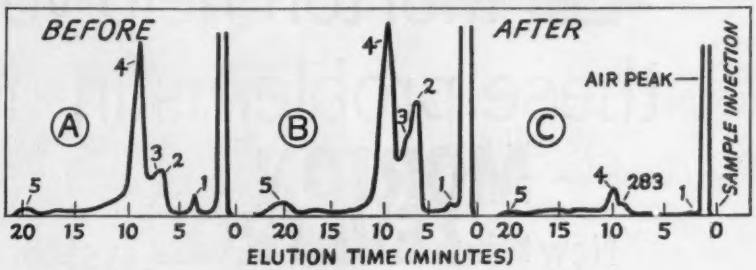
Comparative values of antioxidants may be expressed by taking protective factor of propyl gallate as one, and calculating the "propyl gallate index." Methyl esters of the fats differ considerably in oxidizability in presence of antioxidants. Mono-butyl quinol (MBQ) was the most active of the antioxidants tested.—*J. Sc. Food & Agr.* 11(3), 143-50, 1960.

## Bacteria Found in Oysters Resemble Those in Fish

Pacific oysters taken from Hood Canal, Oyster and Willapa Bays, Washington, contain chiefly Gram-negative rods of the *Pseudomonas Vibrio* groups with members of the *Achromobacteriaceae* next in numbers. Their types and physiological characteristics closely resemble those of free-swimming fish.

The bacteria are highly proteolytic in activity, low in saccharolytic activity. They are psychrophilic, growing readily at 32F., and poorly, or not at all, at 98F.

Natural flora of oysters may therefore be a major factor in spoilage and methods of preservation should be planned to handle such organisms. Oysters tend to have a higher coliform count than the sea water in which they are found.—*Applied Microbiology* 8(2), 104-9, 1960.




**CHROMATOGRAMS** of volatiles from milk. Raw product (A); vacuum chamber of processing unit (B), processed milk (C). Peaks 1-5 were acetaldehyde, methyl sulfide, acetone, unidentified carbonyl compound, and water, respectively.

## Gas Chromatography Is Valuable Check On Efficiency of Vacuum Deodorizers

Volatile components from: (1) Raw, bulk mixed milk, (2) the same milk during vacuum-heat processing, and (3) the finished product, were collected, condensed in liquid air traps, and resolved by GC. Used was a P-E Model 154B Vapor Fractometer, employing thermistorized thermal conductivity sensing cells.

Tentative identification of resolved components was made by comparing retention times and/or volumes of various components with those of authentic compounds and by introducing latter into sample as internal standards.

The tests demonstrated that approximately 85% of the measurable flavor components of milk were removed by vacuum pasteurization, with a resulting 1-2 point increase in flavor score.—*Food Tech.* 14(5), 248-50, 1960.

## Special French Dressing Has Low Calorie Content

Production of a low calorie salad dressing which simulates conventional French dressing in taste, smell, consistency, color and other physicial characteristics is the object of a recent patent.

Crux of the process is elimination of oil and sugar that contribute about 98% of the calories in normal French dressing. To replace the oil. 4 special ingredients are used: (1) A gum such as tragacanth (1.3%); (2) agar (0.2%); (3) pectin (0.2%), and (4) kaolin (1%). Saccharin or cyclomate replace the sugar.

Other ingredients are: Tomato paste (27-30% T.S.), 3%; cider vinegar, 2.5%; spices, salt, color and water.

In preparing the dressing, all powdered materials except salt and agar are intimately dry-mixed. Next, the tomato paste is added to 4/5th of the water and agitated for 5 min. Then blended dry materials are added and the mixing continued until all lumps are broken up. Salt is added and mixing continued for 10 more min.

Remainder of water is heated to boiling and the agar dissolved in it. This is added to the tomato paste mixture. Next, the vinegar is added, the entire mixture agitated for 10 min., then homogenized to form a uniform finished dressing. —U. S. Patent 2,916,383.

## Freeze-Drying Extends Shelf-Life of Coconut

Discrete chunks of dehydrated coconut that retain the white color, texture, and flavor of the fresh product, and have greater shelf life than those prepared by conventional methods is the object of a recent invention.

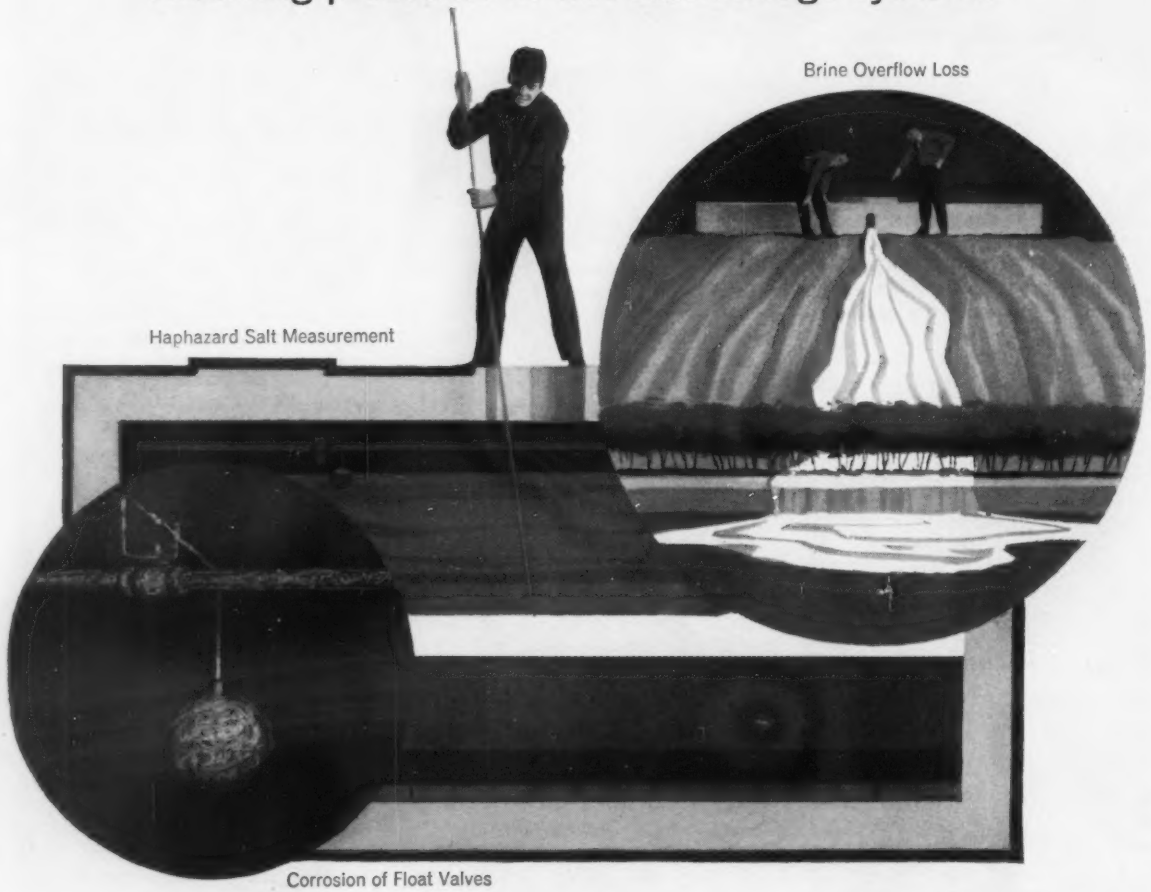
In the process, fresh coconut is shelled, peeled, washed, and chopped into pieces ¼ x ¼ x ½ in. Pieces are slowly frozen (16-24 hr.) to minus 30-40F., then transferred to trays of dryer through which high-velocity (100-150 ft./min.) hot air (170-180F.) is blown. Depth of product in trays should not exceed 1½ in.

In 2-3 hr. moisture content is reduced from 50% to less than 1%, bulk density from 30-40 to 15 lb/cu. ft. Chunks are said to retain their

# Let Morton help you solve these problems in using salt

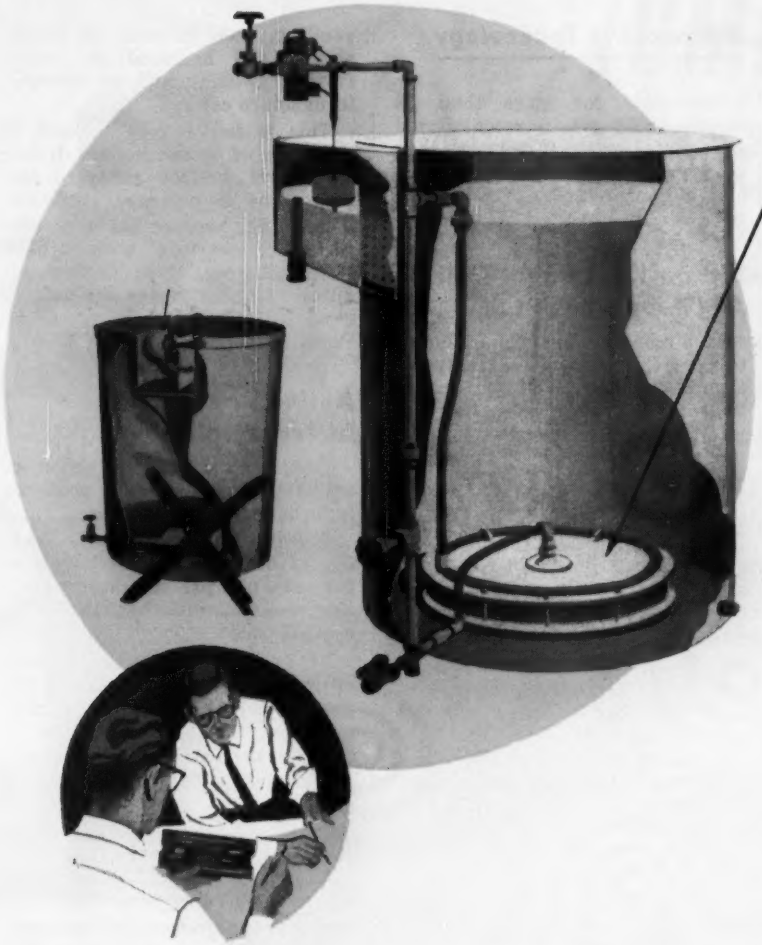
## MORTON LEVETROL*

New LEVETROL system solves these recurring problems in wet salt storage systems




Levetrol is a liquid level control method which automatically replaces water needed in wet salt storage systems in proportion to salt withdrawn in brine form. ¶ Adaptable to most wet salt storage systems, Morton Levetrol protects you from salt losses due to brine overflow by constantly balancing the water level to the salt bed level. ¶ Levetrol also eliminates the troublesome problem of corroding float valves. The simple, dependable Levetrol control system is installed on water lines located away from the wet salt storage. This completely avoids costly corrosion problems and assures you proper brine strength at all times. Levetrol enables you to have complete automation and consistent regeneration of your water treatment system.

*pat. applied for



## New Morton "Fluitron" assembly ends gravel problems in your brinemakers.

The all-plastic "Fluitron" is an exclusive Morton brinemaking device which creates exceedingly high brine make-up rates and completely eliminates the need for gravel supporting beds when dissolving high-purity fine grained salts. The "Fluitron" insures a pure, saturated brine when used with Morton '999' or Purex all-soluble salts. The Morton "Fluitron" diffuses water through the salt bed and also collects the brine for discharge to the brine-use system. By eliminating the gravel bed and expanding the salt capacity of your dissolving vessel, the "Fluitron" relieves you of the job of frequent salt charging.

Adaptable to most brine make-up tanks, the "Fluitron" is included with Morton Model E Brinemaker series or you may acquire it individually on convenient leasing terms.

Morton Brinemakers are now available in two corrosion-free materials—stainless steel or plastic.

## Morton offers you help in solving problems in design, modification, installation or operation of brinemaking equipment.

All of these problems can be solved with the counsel of one of Morton's Brine Engineers. Their experience with all types of salt for brine using processes can provide you with fresh ideas and the latest techniques in solving these problems. Many architects, engineers and plant superintendents already have found that calling upon a Morton engineer can save time and money.

**Problems of salt selection, delivery and handling,** can be easily solved by talking to a Morton man. He can tell you which of 100 different grades of salt will do the best job for you. What's more, Morton's nation-wide service and production facilities assure you dependable delivery of the salt you need in the quantity you want, anywhere in the country.

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☐ Please send booklet on Levetrol System. ☐ Please send booklet on new Morton "Fluitron" and Brinemakers. ☐ Please have a Morton Brine Engineer contact me regarding:

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## *Advances in Technology*

white color for more than 18 months, and when reconstituted with water or sugar solution they quickly return to 50% moisture and closely resemble fresh coconut.—U. S. Patent 2,917,389.

### Frozen Rolls Keep Well At 0F. or Below

If dinner or cinnamon rolls are to be frozen and stored for more than a few days, a temperature of 0F., or below is necessary to maintain their freshness and softness.

Studies were made to determine effect of different conditions of freezing, storage, and defrosting on freshness and firmness of soft dinner rolls and cinnamon rolls.

In first study, units of freshly baked products were equilibrated at 70F., wrapped in 300 MST cellophane and sealed, then frozen at 0F. in still air, and at −20F. with air flow of 1,000 ft./min. They were defrosted after 20 hr. in both still and moving warm air.

Freezing and defrosting caused some loss of freshness and increase in firmness, but only about ½ that produced by storage at 70F. for 24 hr. Slow freezing and defrosting caused a significant increase in firmness — more with cinnamon than with soft rolls.

No relationship was found between moisture loss, freezing temperature, or rate of air flow. Loss during defrosting was about 3 times that during freezing, which suggests feasibility of wrapping after freezing.

Second studies were made with rolls stored for 8 weeks at 20, 10, 0, and −20F. They showed that loss of freshness was large during 1st week at 20F.; equally so during 3 weeks at 10F., but very slight at lower temperatures.

In case of cinnamon rolls there was no apparent loss in freshness after 1 week at 0F., and only a negligible increase in firmness. During following weeks, however, loss of freshness progressed regularly and, after 8 weeks, the rolls rated slightly stale. Storage at −20F. appeared to offer no advantage.—*Cereal Chemistry*, 170-79, March, 1960.

### Quick Cooking Cereal

In a recently patented process for manufacture of quick cooking cereal product, grains are first soaked to cause softening and swelling, then flattened to expose starch, and hydrated to permit further swelling and an increase in moisture content.

This is followed by cooking in minimum of water, hot-air drying to remove surface moisture and set grains in enlarged condition.

Resulting product has a porous, vesicular structure with broken skins adhering. Upon further addition of water grains are said to swell without breaking up.—U. S. Patent 2,930,697, Mar. 29, 1960.

### Active Dry Yeast In Breadmaking

Temperature of rehydration of active dry yeast exerts a profound influence on doughs.

When rehydrated at 105F. only 5% of material was leached from the cells, and performance was optimum—comparable to that of compressed yeast.

At lower temperatures, amount of material leached increased (to 29% at 40F.). This had a marked effect on rheological properties of the doughs. The low temperatures also decreased fermentative power of the yeast.

Result of first effect is manifested by a shorter mixing time, a marked increase in dough extensibility, and a greater oxidizing improver requirement to obtain the best bread. Result of second effect is a considerable decrease in bread quality.—*Cereal Chemistry*, 263-79, May, 1960.

### Controlling Yeast, Molds On High-Moisture Fruits

Potassium sorbate and propylene oxide are equally effective as inhibitors of mold growth on high-moisture dried fruits.

This was demonstrated in tests performed on large, processed, 35% moisture prunes. Fruit was dipped in solutions of the following: Potassium sorbate (20, 10, 5 and 2%); calcium propionate (5, 2, 1, 0.5 and 0.2%); dehydroacetic acid (3,000 and 1,500 ppm.); vitamin $K_5$ (2,000 and 1,000 ppm.), and propylene oxide (1.5 ml./lb.). Following draining, they were sprayed with a suspension of mold and yeast isolated from spoiled prunes.

Of the above products, only two, potassium sorbate (2% sol.) and propylene oxide gave satisfactory protection. — *Food Tech.*, 113-15, Feb. 1960.

# JUMP AHEAD
## OF COMPETITION

## WITH AEROSOL PACKAGING BY STALFORT

The economy of our high speed lines, (150,000 units per shift) plus tremendous warehouse space to hold the filled containers for drop shipments, has led many of the nation's leading brand names to move to Stalfort.

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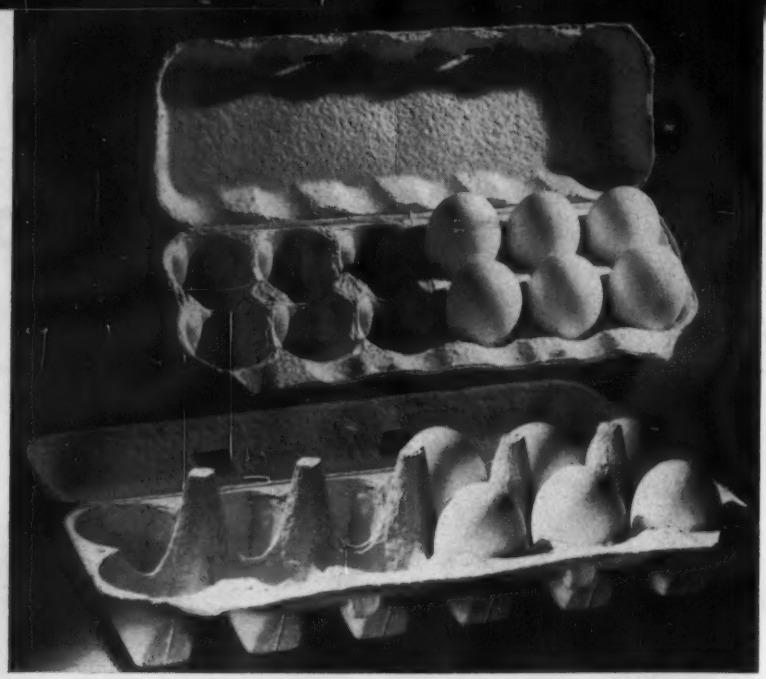
TASTE - TEMPTING designs of multi-colored pictorials are attracting housewives to specific brands and building egg sales volume with "mealtime" illustrations.



BREAKAGE-CUTTING Pillopost carton (bottom) features pillars that isolate eggs into safe compartments and support cover during handling. Cited are savings due to less damage than with standard-type package (top).

# Try New Packages To Correct Sales Slump

**Drooping per capita consumption has egg packers turning to pictorial, film-wrapped, and plastic cartons in attempt to recoup losses**

CONSUMPTION CRISIS! It's hitting hard at the nation's egg packers, who are looking to their suppliers for new and better ways to halt a steady 12-yr. sales decline.

While technologists discuss the marketing potentials of egg-coated cereals, frozen eggs, aerosol eggs, and fried egg bars, progressive-minded packaging firms are testing new ways to boost consumer egg appeal.

**Reason for the crisis? Per capita civilian intake has dropped from the '47-'49 average of 385 to 345 eggs in '59. Worse yet, the initial '60 reading hovers around the 336 mark (USDA).**

For years, this basic food has presented a dull picture to the consumer in its rough-board box of unimaginative design. But now, the shopper is being offered decorative pictorial cartons, cellophane-wrapped cartons, and even plastic boxes.

While a few pictorials were tried in the past for egg packaging, the idea had not met with the success it now enjoys on a national scale, although marked sales increases have been noted for attractive "meal-time" designs used on butter, ice cream, and cheese packages (See FE Jan. '58, p.74). Modern thesis is that the best way to display a product is to show it in action.

Leading the way in latest pictorial surge is the Molded Packaging Div. of Diamond National Corp., a major supplier of egg cartons. Top chains like National Tea (Natco) and Safeway (Lucerne) are still measuring sales increases chalked up to appeal created by mouthwatering designs

**JACK L. MISCHOU**
Assistant Editor, "Food Engineering"

DIE-CUT HOLES in cellophane-wrapped package assure customer of good grading. Attractive appearance and extended egg freshness are prime reasons for carton's sales success in Southwest area.

VISUAL APPEAL of plastic carton is combined with positive stacking, moisture-retention, and reduced breakage. Box is constructed of acetate cover punch-sealed to polystyrene bottom.

of the many prescribed or stock illustrations available from suppliers. And the giant Eastern Food Fair chain is showing illustrated cartons (American Can Co.) to metropolitan housewives.

**Pictorials are expected to spur sales in two ways: First, by making the carton stand out to consumer for impulse persuasion; and second, by illustrating varied uses of eggs.**

Eggs in salad, poached eggs, bacon and eggs, and other in-use designs, give the shopper a better idea of what the product can do for her family meals. Result is not only increased brand sales but upped egg consumption.

Of course, illustrated cartons are more costly than standard single-tone types. Thus, most early users are the larger firms, although smaller packers, anxious to stimulate sales, have found them worth the added expense.

Prices for pictorials vary on number of colors and size of order. In general, for orders of over 100,000, typical supplier's scales run from $23/1,000 pieces of standard 2x6-in., 1-color cartons to $25.25 for 2-color, and up to $29.25 for 5-color. Thus, a 4-color carton would cost about ½¢ more than regular paper cartons.

## Seek to Cut Breakage

According to Eric Erickson, manufacturing v.-p. for Molded Packaging Div., there also are advances in protectiveness of cartons. As packers' profits average only about ½¢/doz. eggs, breakage can be disastrous. When breakage approaches 15%, the profit goes by the boards.

Introduced last year, the "Pillopost" carton ($24.50/1,000) offers maximum protection through its unique construction. Eggs nestle into grooves formed by tall pillars reaching up to support carton top. This heavy board and pillar support is minimizing breakage for several packers.

Well along on the drawing board is a carton expected to provide the attractive appeal of pictorials with the protective qualities of the Pillopost. Here, labels, equally as decorative as on present paper pictorials, will be glued to tops of regular pillow post-type cartons. Distribution of this model is expected this year.

## Wrapped in Film

Down in Texas, cellophane-wrapped cartons are brightening up dairy cases and providing significant sales increases.

Harry A. Cannary, v.-p. and sales manager of C. P. Evans Food Stores, headquartered in Galveston, reports a 20-25% sales volume increase in first two weeks of wrap use, with sales hovering around 15,000 doz. per week.

Moreover, the big "7-11" chain in Houston is reaping sales gains as high as 12% with wrapped packages, according to Kay Lance, chain owner. Door-to-door sales by the local "Sanitary Dairies" have also found good consumer acceptance of the new carton wrap.

Packing and supplying over 2,000 cases weekly to these and other Eastern Texas supermarkets and dairies is the Lone Star Robin Hood Egg Co., Houston subsidiary of Texas Farm Products Co.

In the introduction of the wraps, Evans' store managers in Galveston, Beaumont, Alvin, and La Marque, were given a free hand in deciding what eggs to stock and for how long. Three types were wrapped—Large Grade A White (selling 2-3¢ above unwrapped), Large Grade A Mixed, and Medium Grade A. Inside of two weeks, individual managers had reported that equivalent unwrapped eggs "didn't even begin to move." Backed by heavy local newspaper promotion, sales jumped.

**Reasons cited for film's success are:**

**. . . Attractive appearance of glossy surface.**

**. . . Tamper-proof quality of overwrap.**

**. . . New protection against acquiring of other food tastes in storage.**

In addition, American Viscose Corp., a major cellophane supplier, is testing film-wrapped eggs for extended freshness. Indications are that eggs have been kept fresh "significantly longer" because of overwrap's ability "to control oxygen, aroma, and moisture transmission."

Film used is moistureproof 300 MS 4, priced at 67¢/213 sq. in. (AVC). Assuming use of a $5,000 wrapping machine amortized over 2 yr., (Hayssen), to cover 30,000 doz. per week, total added cost runs to less than 1¢ a carton. No immediate future is seen for packing less than 1,000 cases weekly.

Breakage in overwrapping has not created a serious problem. None is reported by Texas firm at speeds up to 33 per min., although faster speeds produce some.

According to the film supplier, the package is attracting national interest. Similar wrapped cartons are now making successful appearances in Minnesota and Ohio.

## Plastics, Too

Out in Chicago, Jewel Tea Co. is turning out 3,500 doz./weekly in plastic "C-12" cartons. National Tea and Child's Big Chain Div. of Kroger in the Southwest

are also using the acetate-polystyrene box as a sales stimulus.

**Features include:**

**. . . Extra visual appeal for added impulse buying.**

**. . . Positive stacking during shipping and display.**

**. . . Moisture-retention through non-absorbent materials.**

**. . . Reduced breakage during packing, shipping, and retail handling.**

In addition, the consumer's confidence in grading quality is increased because she sees what she is buying.

The carton, of 2-piece construction, has clear cellulose acetate top and blue bottom formed of high-impact polystyrene. Cover may be printed at both ends according to brand, grade, and supplier.

Market data for the plastics is not yet available, although National Tea has followed its initial trial run with an additional order of 20,000 from the supplier, Kingston Products Corp., Kokomo, Ind.

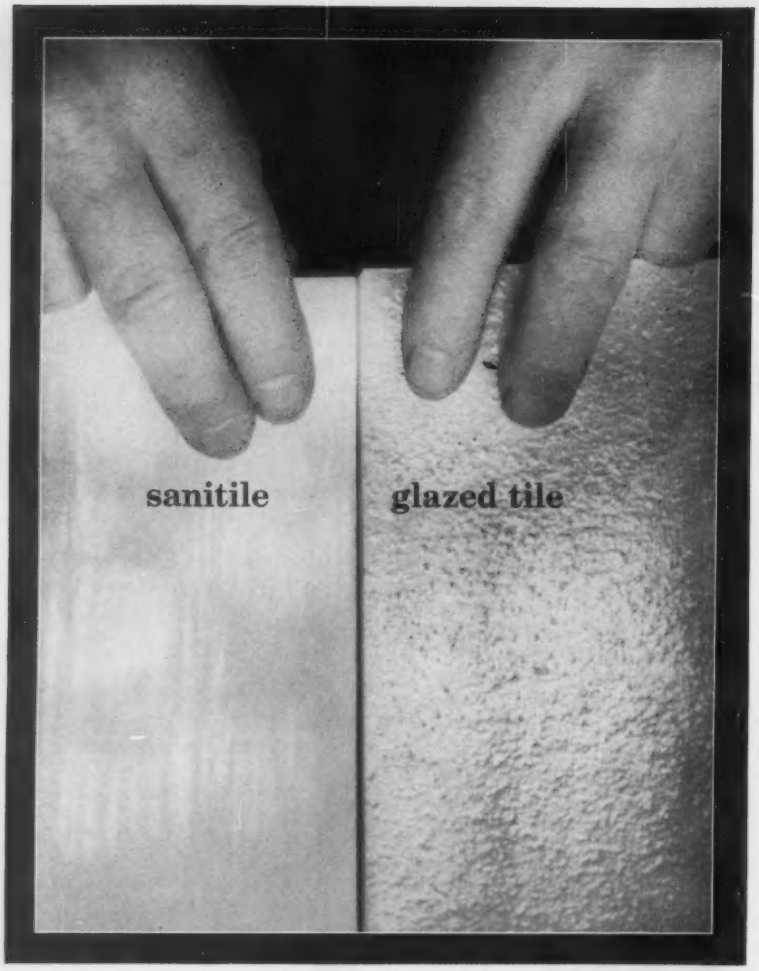
Prices are still well above standard pulp cartons, making these containers primarily suitable for large packers handling large premium eggs. As one official puts it, "We're selling a premium egg in a premium package at a premium price."

Currently, plastics from Kingston sell for $66M, f.o.b. Kokomo, about $36-38M more than top pulp cartons. While officials note that the plastic carton is an expensive package for a relatively inexpensive item, it is believed that the continuous manufacturing process (53,000 cartons a day), plus narrowing gap between cost of paper and plastic, may bring the carton closer to more packers' budgets.

## Consumer Paradox

Ironically, the decline in per capita consumption does not fit the findings of a recent survey carried out by the Poultry & Egg National Board. Results noted that consumers believe eggs are important, with four out of five feeling that the product is an economical commodity.

Thus, while almost all packages noted here are more expensive than old-fashioned types, packers are more than ready to try any method that might reverse the downtrend in consumption. And in many cases, it is paying off handsomely. (End)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**EASY-OPEN DEVICES** are gaining favor among food firms as answer to housewife grumbling about hard-to-handle cheese wraps. Borden's film-wax-film "sandwich" acts as reclosure when crimped over opened end of pack. Tear string on Kraft pouch, imbedded

# Cheese Wrap Hikes User-Appeal

WINNING a luxury price for an everyday staple calls for some doing. But ambitious Borden Food is out to do just that with a new cheddar cheese line that boasts a couple of unusual packaging twists as strong selling points.

With natural cheddar said to be gaining at a faster rate than the processed version in recent years, Borden hopes to give this trend an extra push with a gourmet-style item. And it plans to do this with a combined product-package convenience that's sure to answer housewife grumbling about hard-to-open cheese wraps.

**What's involved is a block-shaped cheddar (compared to the conventional pie wedge). It is available in three varieties, sized for easy in-home use. And it is packaged to provide extra shelf protection, as well as convenient opening and reclosing. The firm feels that this combination should end the most frequent complaints levelled against cheddar cheese packs. These are: Inadequate keeping quality and inconsistent flavor of store-wrapped versions, hard-to-use protective wraps of factory-packed products, and bewildering variety of awkward shapes and sizes.**

The new block-type item (3½ x 3½ x 1⅝ in.), sold in 13¼-oz. size, comes in three varieties—medium sharp (aged 6 mo.), sharp (1 yr.), and extra sharp (18 mo.). Product dimensions are designed for the many uses cheddar is put to in the home. Two slices fit a standard slice of sandwich bread, one slice is just right for melba toast, and a half slice is practically the same size as a cracker.

A key point in the product's sales appeal is its unique film-wax-film "sandwich" package—two layers of Saran surrounding a wax "jacket."

Here's how the packaging is carried out: Blocks of specially selected, premium quality cheddar are first overwrapped in 135-gage clear Saran at a 42/min. rate.

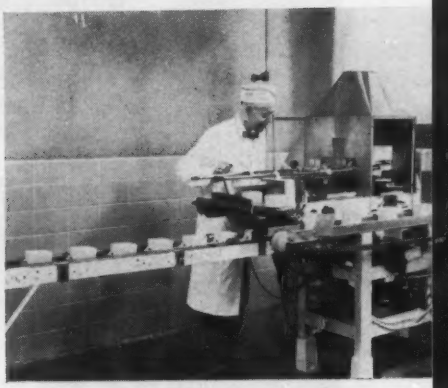
They are then conveyed to the key step in the operation—an enclosed wax sprayer recently devised by Liquid Film Corp., Milwaukee. Here a jet spray of a microcrystalline wax completely enrobes the film-wrapped cheese on all six sides at a rate of 42/min. The evenly coated blocks then travel along a cooling belt where an air blower quickly "sets" the wax.

While wax coating of cheese is hardly new, this is the first time, according to Borden, that conventional dipping has been replaced by a machine method. The company says that the sprayer gives the cheese a more even coating than is possible with hand dipping. As a result, the product gets a near-perfect air-tight seal, which prolongs shelf life.

The cheese block is next conveyed to a manual overwrapping station. Here, six girls, working with reverse printed, pre-cut 75-

in film, opens side of package after housewife peels off upper corner. Armour's cellostrip, machine-folded in after wrap's been heat sealed, acts as pull tab to permit separation of wrapper without tearing.

## 1-2-3 of Unusual 'Sandwich' Wrap



**INNER** layer of 135-gage clear Saran is automatically applied at 42/min. rate to block-shaped cheddar.

**Borden's new plastic-wax-plastic 'sandwich' ends consumer complaints about hard-to-open pouches, extends product shelf-life, and contains built-in reclosure device**

**ENROBER** sprays wax coating evenly over all six sides of wrapped product, which then travels along cooling belt.

gage Saran, apply the outer wrap, using hot plate sealers.

Borden hopes to mechanize the final step eventually. Chief problem is modifying existing wrappers to overcome Saran's tricky handling as well as prevent wax build-up in wrapping machinery during the critical heat sealing dwell time.

### Dual Benefits

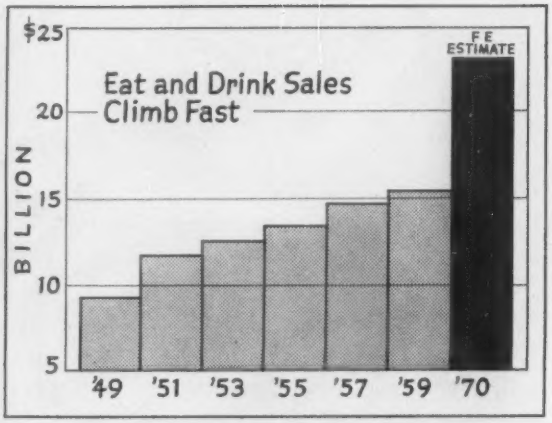
Besides the greater product protection that's provided, the wax coat also enhances the all-important convenience factor. After the housewife slices off the end layer of the film-wax-film "sandwich," she can use it to recover the exposed surface of the product each time she cuts a slice. This new re-capping feature helps keep product exposure to a minimum while the cheese is in the refrigerator.

Idea for the package started in Borden's corporate R&D center, where new films are continually tested for possible use in the company's product line. When the sales department told R&D it wanted an unusual package for a proposed Gail Borden Signature Quality line of cheddars, Saran was picked because of its inertness to cheese and its very low permeability.

The wax coating idea came when researchers hunted for a method which would end housewife complaints about hard-to-reclose cheese packages. At first, the wax was applied by hand. Later, the company tried out Liquid Film's sprayer, which the maker was slanting to luncheon meats. Modifications were made in the equipment to handle cheese products.

Borden plans to merchandise other varieties in the same film-wax-film pack. However, the package will be limited to the Gail Borden Signature Quality brand premium items.—FE Staff.

**OUTER** wrap of reverse-printed film is hand-applied by employees using manual heat sealers.




STEADY RISE in expenditures for eating and drinking is expected to spurt ahead in new decade. Projected FE estimate of $24.2 billion in '70 is $15 billion ahead of '50. Source: U. S. Dept. of Commerce.

# Dining-Out Sales

## Early returns point up rapid pace set by institutional market . . . General Foods survey tells who's

EVERYTHING'S ROSY thus far in the '60's for institutional sales and the biggest eating-out splurge is yet to come.

While expenditures for dining away from home have risen steadily since '50, new dacade is expected to provide an even larger share of the food market to manufacturers who supply the nation's many restaurants, hotels, motels, cafeterias, etc.

**In the first 4 months of '60, an FE check of available data notes a 5.6% increase in total personal expenditures and a 6.5% boost in sales of eating and drinking establishments.**

Here are some projection indicators that say even more for '70:

- . . . **Discretionary income — almost twice as much as '50.**
- . . . **Population—may be 40 million more.**
- . . . **Leisure time—less than 38-hr. work week.**
- . . . **Recreation—up 70% in sales.**
- . . . **Cars—can reach 100% more than now.**

**JACK L. MISCHOU**
Assistant Editor, "Food Engineering"

And, according to a recent General Foods' survey, Americans are today spending more than $1 billion per month on meals away from home, over 15% of the nation's total food bill.

With more leisure time available for recreation and travel, and more cars to move more people carrying fatter wallets, estimates for eating out in '70 reach as high as $24.2 billion.

Other factors are equally important. Increased urbanization leaves a trail of statistics indicating more institutional sales. And prospects are for more and more living in the new Megalopolis.

Then, too, past figures illustrate that, as national per capita income increases, expenditures for food away from home are likely to account for a larger portion of total food expenditures.

### New Info on Habits

Personal interviews were made in 2,000 homes in all parts of the country. On the basis of these, GF and National Restaurant Assn. developed a modern eating-out index and consumer attitudes survey.

Report, which provides valuable information for institutional manufacturers, is based on a 1-wk. period just prior to the interviews. A February week was used despite lower yearly restaurant sales during this month.

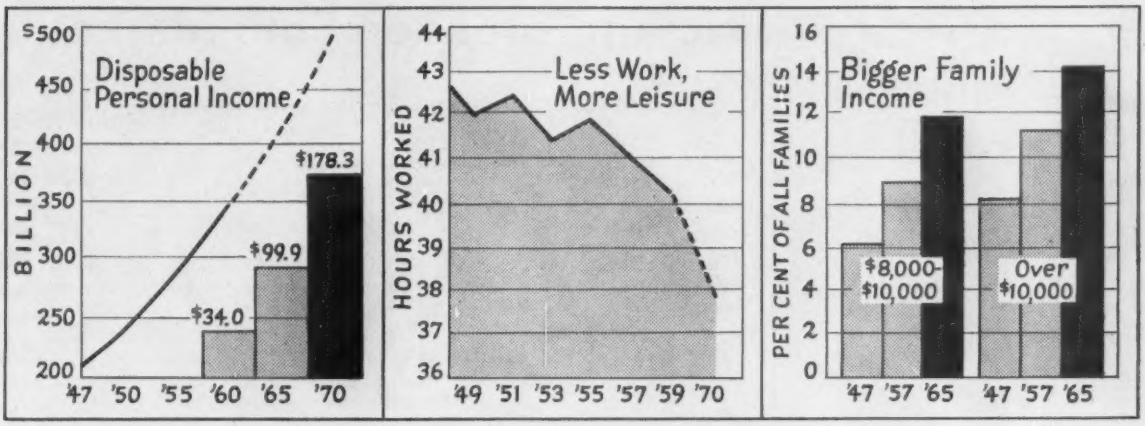
Over 43% stated they had eaten at least one of the three regular daily meals away during the seven days preceding the survey. Projection to nation's total population means that about 48,200,000 Americans ate out last week.

Around 5% had been out for one or more breakfasts; 30% for one or more lunches; and 25% for one or more evening meals. Average (mean) number of meals was 3.4, based on those who ate any out. For all persons interviewed, average was 1.5 meals.

Of all meals eaten out, 11% were breakfasts, 61% lunches, and 28% evening meals.

Most noon meals (29%) and evening meals (44%) were eaten at restaurants with table service. Diners, drive-ins, and hamburger stands served the most breakfasts (31%).

Majority of breakfasts and lunches were necessary because




PRE-BOOM INDICATORS signal added institutional sales in '70's. Estimated disposable personal income addition of $178.3 billion will bring total DPI to near $500 billion. Reduced work week (less than 38 hr.) provides more time for travel and eating away from home. Larger family incomes (26% over $8,000) also mean more restaurant-type sales. (Graphs courtesy of Marplan Affiliates of McCann-Erickson).

# To Gain Fast in '60's

## doing the buying and what you can expect in '70

of business or work factors. Reverse was true for evening meals. Over 65% ate evening meals out voluntarily, while 25% ate breakfasts and 18% ate lunches by choice.

About 1 meal in 10 was eaten out for business reasons, while weekday noon meals (14%) and evening meals (12%) were most likely to be business-connected.

### How Much Spent?

Average per capita expenditures ran: 78¢ for breakfasts, $1.16 for lunches, and $2.19 for suppers. Those on weekends averaged a higher per capita cost than during-the-week meals.

For the big evening meal—including alcoholic beverages—highest average outlays were by persons with over $8,000 income ($3.15), Western residents ($3.07), and residents of areas with over one million population ($3.07). Same groups had highest average expenditures for noon meals.

For those families in which the male or female head had eaten out in the past week, the average unit spent $10.97 on regular meals. The average outlay was $4.69 per family based on all households sampled, including non-diners.

Based on an estimated 51,300,000 households in the nation, this provides an estimated total meal check of $240,600,000 for one February week. This totals $962,400,000 for the month, and about $12 billion/yr.

**This estimate does not include expenditures for children and other family members when eating out without the male or female head of the household.**

Sharp fluctuations in incidence of dining out were noted for family income, running from 29% among those in the under $4,000 group steadily upward to 59% in the $8,000 and over category.

Strong optimism for '60's is thus supported by the steadily rising income factor.

Geographically, incidence was a little higher in the East and far West (46% each) than in the North Central and South (42% each).

In the larger cities of over 1 million, dining out was most prevalent (51%). In areas of 50,000 to 1 million, incidence dropped to 47%, and cities of 2,500-50,000 noted 40% eating away from home. Thus, increased urbanization indicates a higher percentage of restaurant sales in '70.

### Why Eat Out?

Those who chose to dine out said they did so for pleasure, with family or friends, as a change of pace, special occasions, or easier than cooking at home.

In the booming travel category, reasons included eating out on vacation trips, weekend trips, business travels, and Sunday drives.

More favorable attitudes were found among women than among men, among younger than among older people, and among high income families than in low income ones.

Geographically, dining out was most likely to be considered a good way to enjoy oneself in the West (76%) and least likely in the South (64%).

Deterrents to eating out, cited by those who said they'd like to do more of it, include expense, children, time, and health reasons.

Around 33% of all respondents would like to eat out more often while 11% said less often. The remainder replied that they'd do the same, or had no opinion.

That's what they have been doing and what they hope to be doing. With the soaring statistics of the '60's, it can be an even bigger profit source for the institutional supplier. (End)

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# How to Broaden Your Market

From files of *National Consumer Panel of Market Research Corp. of America* . . . Material is factually correct. Identities of products and companies have been masked to insure anonymity—The Editors*

**MARKETING CASE HISTORY OF MONTH**

**Management's problem**

ALTHOUGH OUR PRODUCT is available in several flavors, one of them continues to receive the bulk of consumer purchases.

Hoping to widen our market, we have been emphasizing all flavors in our advertising, promotion and merchandising efforts. Included in this activity has been a "buy-back" offer for consumers purchasing one or more of the other flavors along with the most popular flavor.

As a result, both our brand share and sales volume are up this year. And we are under considerable pressure from our salesmen to repeat the "buy-back" offer.

Before going ahead, we want to make sure that the gains we have registered can be traced to the offer or if other factors were primarily responsible.

## WHAT WOULD YOU DO?

**Management's decision**

We analyzed the purchase records of the families in the National Consumer Panel of the Market Research Corp. of America. This check covered the periods prior to, during, and following the offer.

Because the families, selected to represent a statistical cross-section of all U. S. households, report weekly on their purchases of a wide variety of grocery products, we were able to focus our attention on the specific period of the offer.

As we had expected, sales volume increased significantly during the promotion. We also learned that the number of customers buying two or more flavors was more than double that of the preceding period.

Also important was the fact that our brand share went up markedly.

While this information was encouraging, one problem remained. Namely, in order to evaluate the real effect of the "buy-back" promotion, it was necessary to determine if families who were introduced to the other flavors continued to buy them in the post-offer period.

Consumer purchase records showed that such indeed was the case.

When we compared the post-deal period with pre-deal sales, we found that purchases of two or more flavors were considerably higher. Also, that we had retained a substantial portion of the increase in brand share achieved during the promotion.

This showed that the offer had encouraged greater subsequent use of the slower moving flavors.

**Result of action**

**Having learned to our satisfaction that the offer was successful in expanding our market, we are now in a good position to repeat it. By knowing to what extent sales of all flavor varieties were actually increased during and after the deal, we can do a better job of pre-selling the promotion to distributors, scheduling merchandising coverage, and tying in national advertising.**

* For more information, write to FOOD ENGINEERING, 56th & Chestnut Sts., Philadelphia 39, Pa.

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*2*) Clark dealers, with the aid of a national service personnel training program, assure you that the best trained mechanics in the industry will service your equipment. These highly trained specialists perform a minimum of 22 separate inspections on every truck serviced. They not only perform the normal jobs of greasing and oil changes, but also make all necessary adjustments to your equipment. Most important, they report the condition of your machines, anticipating failure before it happens. As a result . . . *downtime* is drastically reduced.

*3*) A Clark Dealer Continuous Maintenance Program gets you out of the repair and maintenance business. It eliminates the need for special tools, parts stock and use of valuable plant space for servicing facilities.

*4*) A Clark Dealer Continuous Maintenance Program is economical. It actually costs less than similar service on your own automobile. This is an inadequate comparison, however, when you consider the small cost of preventive type maintenance to the cost of *downtime*.

For detailed information on a Clark C.M. program call your local Clark dealer (he's listed in the Yellow pages) or write: C.M. Service, Clark Equipment Company, Battle Creek, Michigan. No obligation, of course.

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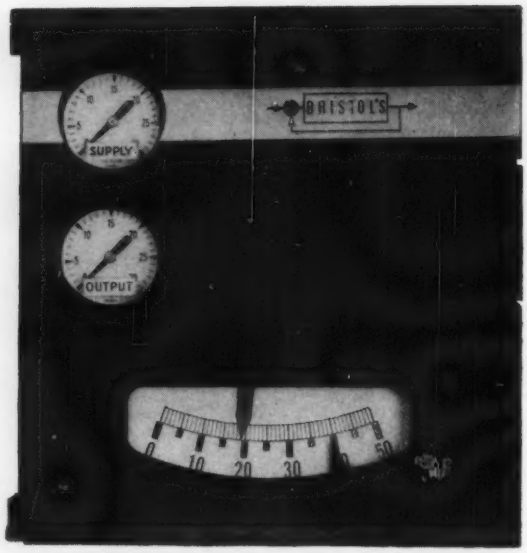
# NEW BRISTOL'S

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**PROPORTIONAL BAND:** 0-400% continuously adjustable, direct- or reverse-acting.

**RESET:** 0.1 to 50 repeats per minute.

**AIR PILOT:** Non-bleed type.

**PILOT CAPACITY:** 4.0 scfm.

**FREQUENCY RESPONSE:** Flat to 400 cycles per minute.

**TEMPERATURE STABILITY:** Less than 0.1% change in the output pressure for 90°F temperature change.

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## More R-P Actions Ahead

Two separate actions last month hinted at increased Robinson-Patman activity on the food front in the near future.

FTC, to rebut the familiar plaint that R-P is too complicated for simple folks, trotted out a 16-point "staff guide" for advertising allowances and related services. Written in laymen's language, the guides explain what's allowed and what isn't, contain typical examples of each, and end up with the warning that "they do not offer either new interpretations of the law or change or amend the laws."

Almost concurrently, the US Supreme Court ruled that the brokerage section (2c) of R-P applied to brokers as well as sellers. In effect, the court said a broker couldn't cut his commission to make a lower price possible for one customer. Any reduction must be given to all buyers, the court held.

## Top Ten Food Advertisers

GF's $61.0-million outlay last year made it the biggest industry advertiser, followed by GM ($30.8-million) and National Dairy ($22.0-million). This is the same sequence that held true in '58, according to *Advertising Age's* annual compilation.

Next in order were: Kellogg ($21.7-million), Campbell ($19.0), Standard Brands ($17.7), Continental Baking ($16.0), Corn Products ($15.8), Pillsbury ($15.7), and Anheuser-Busch ($15.3).

## Giving New Products More Go

What's needed to get the most from a new products department was outlined by Harry Hodge, Green Giant controller, at last month's American Marketing Assn. national conference. First, he says, give one man complete authority for setting up the unit so he won't be sidetracked by the inevitable personality problems that occur when functions taken from existing departments are placed in the new one.

Personnel for the NP unit, he adds, should include: An administrator who knows how to look for ideas, sift the good from the bad; an individual capable of independently assembling a complete financial projection of each new item; an executive who will know how to get the most from R&D specialists; and staffers with engineering and marketing skills.

How long does it take to get such a unit going? From 6 to 9 months, Hodge says, "if you have a good administrator who won't pussy-foot on personality problems."

## Freezers Cry Halt

In a show of unity rare for the scrappy frozen food field, nine trade associations last month linked hands and managed to win a 2-yr. respite from the proposed AFDOUS frozen food code (see FE April p. 39). The groups promised to work up integrated standards of quality control that will serve as the basis of a self-policing program.

Impressed, AFDOUS asked the task force to make a report on its program next June, and agreed to inform local authorities that sections of its own proposed code "are not suitable for adoption" in present form.

## Out of Sight—Out of Sale

Key importance of keeping your product within reach of would-be buyers is demonstrated once again by an A. C. Nielsen study of the factors behind brand leadership in '59. Focusing on the 10 brands that showed the most impressive gains, Nielsen found product availability (shelf space, new outlets) to be the most important factor in their success.

Other key elements: Product characteristics (newness, convenience, high quality, more sizes, improvement), promotion (consistent advertising, timing, correct media), and price.

## BRIEFS

**More light on chains' food manufacturing:** That's what FTC will probably accomplish, judging by tack of legal queries at hearings on anti-merger case against National Tea, plus first installment of commission's "economic inquiry" report.

**Full-color ad mat service** offered by Campbell Soup to retailers.

**Cottage cheese consumption, up 80%,** enjoyed fastest growth of any major dairy product in '47-'57 period, USDA reports.

**Outdoor eating peps up delicatessen meat sales** by 20% between July and Sept., says Pres. Leonard Pines, Hebrew National Kosher Foods.

**Destroying food store image with influx of too many non-foods** may drive housewives elsewhere for their eateries, warns A. M. Driscoll, head of American Rack Merchandisers Institute.

**Participants in last year's "Potato Chip Time" drive** upped sales from 3 to 9%, reports PCII in announcing '60 version starts Oct. 10.

**Vending machine shipments scored 17% boost** in '59, according to National Automatic Merchandising Assn. Food units up 29%, beverage 23%.

**Mass giveaway of 8 million bottles of pop** planned by Squirt as part of national sampling drive.

**Breather in population boom:** Births in first quarter down 2% from record '59 period, and March marriages off 4.2% vs. year-ago.

**New yardstick for ad budgets:** Market Research Corp. of America, using its National Consumer Panel, now measures how much the audience of specific media spends for particular product.

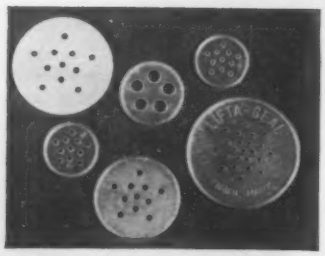
**FTC can bar regional price cuts,** US Supreme Court ruled in celebrated Anheuser-Busch case. Brewer had been hit with price discrimination charge when it lowered prices in St. Louis area alone. Case was returned to lower court to decide if A-B's action hurt competitors.

# WS SIFTER TOPS

**Easy to apply**
Just snap on

**Economical**
No cap liner needed

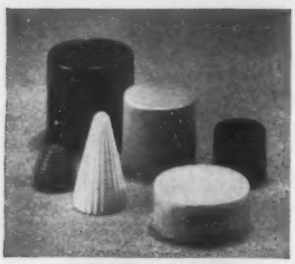
**Sales-wise**
WS Sifter Tops build repeat sales



WS makes plastic caps (custom and standard), tips and fitments, lead and aluminum fold-up tubes.

*Ask your WS salesman, or call collect . . . Crestview 7-3000*

New York, N. Y.
Lackawanna 4-9715
Chicago, Ill.
Palisades 5-3020
Cleveland, Ohio
Academy 6-5757
Cincinnati, Ohio
Parkway 1-5736
St. Louis, Mo.
Parkview 7-7380
Los Angeles, Calif.
Pleasant 2-0791



WHEELING STAMPING CO.
WHEELING W. VA
WSCO


# MEN & COMPANIES

**GF Tightens Reins . . .** Chicago-based Perkins and S.O.S. divisions of General Foods Corp. are now consolidated.

E. F. Fitzmaurice, Perkins general manager, takes over same post of new Perkins-S.O.S. Operation handles Good Seasons Salad Dressing Mixes, Kool-Aid, Twist, and Kool-Pops, plus line of soap-scouring pads.

E. F. Fitzmaurice

At same time, Charles E. Jolitz, S.O.S. general manager, was named president and general manager of California Vegetable Concentrates, Inc., new GF subsidiary producing dehydrated vegetables for food processing trade. Headquarters are in Huntington Park, Calif.

C. E. Jolitz

No change is planned in distribution of Perkins or S.O.S. products, now handled by brokers. (Bachrach Photos)

**Heads Growth Planning . . .** Major move in big reorganization program at Corn Products Co. is appointment of Aaron S. Yohalem as senior v.-p. in charge of corporate development.

Newly-created position holds responsibility for all matters of growth, but primarily acquisitions and new products.

Aaron S. Yohalem

CP Pres. William T. Brady also announced appointment of Alexander N. McFarlane as president of the subsidiary Corn Products Sales Co. Division handles merchandising of firm's domestic consumer and industrial products.

In other moves, William A. Schroeder was named executive v.-p. of CP Sales in charge of the Best Foods Div. Harold Plimpton is new executive v.-p. handling Industrial Sales Div.

Mr. Yohalem was a v.-p. of The Best Foods Inc., prior to its merger with Corn Products.

## Personnel

**E. L. Barr,** Muscat Cooperative Winery Assn., Kingsburg, Calif., is new board chairman of the Wine Institute.

**Richard J. Bender** is now divisional v.-p. of purchasing for Anheuser Busch, Inc.

**F. J. Delaney, Jr.,** is new president of Biscuit & Cracker Manufacturers' Assn. Named to v.-p. posts are **G. H. Coppers, W. W. Paddon,** and **George H. Strietmann.**

**Frank Edelstein** takes over as marketing director for B. Manischewitz Co., Newark, N. J. **Philip Goldberg** moves up to position of general sales manager.

**Gordon Ellis** is now executive v.-p. and general manager of Food Products Div., Pet Milk Co. **William N. Harsha, Jr.,** is v.-p. and assistant to **Pres. Theodore**

**R. Gamble**, and **James A. Dodge** assumes marketing v.-p. post.

**Henry C. Frost** moves up to newly-created position as director of long-range planning at Corn Products Co.

**W. Ralph Hopkin**, president of Marquetand's, Inc., Philadelphia, has been elected president of Associated Retail Confectioners at annual convention in Philadelphia.

**Charles M. Humphrys**, Kelly, Douglas & Co., Vancouver; **B. W. Maxey**, The Glidden Co., Cleveland; and **Stanley B. Murray**, M. J. B. Co., San Francisco, are finance officers named board directors of Controllers Institute of America.

**Dr. Hans Lineweaver**, chief of Poultry Lab at USDA, Western Utilization Research & Development Div., Albany, Calif., will serve as director of Institute of American Poultry Industries' Research Council, succeeding **Dr. Carl H. Koonz**, Swift & Co.

**Robert S. Lochridge**, marketing manager of Kraft Foods Institutional Products Div., is third recipient of Golden Key Award given by IFMA.

**Burton N. Lowe** is new advertising and merchandising manager at E. J. Brach & Sons.

**James D. MacGillivray** has been appointed central regional sales manager for Minute Maid Corp.

**Dale D. McConkey** is new director of personnel and labor relations at United Fruit Co., Boston.

**Charles P. McCormick, Jr.**, McCormick & Co., Baltimore, is new president of Flavoring Manufacturers' Assn.

**Donald E. Morden** takes over quality control director's post at Kal Kan Foods, Inc.

**Crawford Pollock** is new Green Giant Co. v.-p. and **Harry Hodge** assumes controller's post. At same time, **Robert C. Cosgrove** takes over direction of new Corporate Planning Div.

**Edwin W. Rawlings**, financial v.-p. of General Mills, has been named executive v.-p. in charge of finance and consumer foods activities.

**Hubert O. Ranger** is new director of packaging lab at General Foods' Research Center in Tarrytown, N. Y. **G. A. Kolman** is Center's new operations manager.

**Sam D. Thompson**, former v.-p. and director of trade and industry relations of Borden Foods Co. division, is now director of trade and customer relations for entire Borden Co.

## Industry

**Fairmont Foods Co.** announces acquisition of all capital stock of **Austin Biscuit Corp.**, Baltimore.

**General Foods Fund, Inc.**, independent foundation sponsored by GF Corp., has announced education grants totaling $525,000 for '60.

**General Mills' Pres.** C. H. Bell states firm has acquired business of the **Daven Co.**, Livingston, N. J., and **Laible Manufacturing Co.**, Manchester, N. H., both electronic components producers.

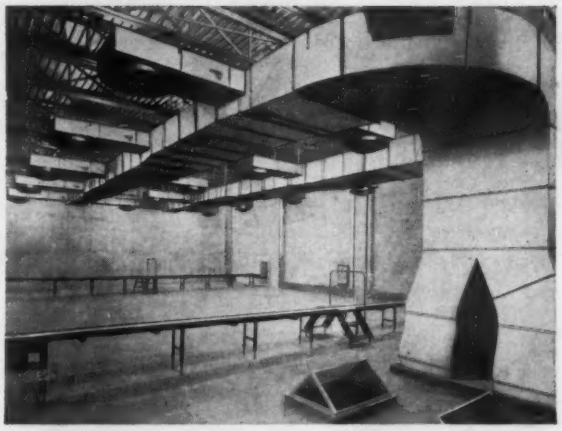
**Hunt Foods & Industries, Inc.**, and **Wesson Oil & Snowdrift Co., Inc.**, expected to merge June 30th as a result of overwhelming approval of both firm's stockholders.

**Wm. Schluderberg - T. J. Kurdle Co.**, Baltimore meat packing firm, has been honored by the American Humane Assn. in recognition of 100% humane slaughter operations.

**Pillsbury Co.** has announced an agreement with the Ghana government to build and operate a flour mill near Accra under joint ownership. The structure, planned to produce a million hundredweight/yr., will be completed within 2 yr.

**Shoreline Enterprises of America, Inc.**, Tampa, Fla., a division of **Salada-Shir-**


King Engineering Report



How to design and locate Sharp Freeze Systems for THE YEARS AHEAD...

At the King Co. system engineering is a science because fifty years of experience has demonstrated that no two plants are exactly alike. King engineers design and locate each unit where it will:

1. not interfere with plant expansion
2. minimize infiltration
3. use least valuable floor space
4. not conflict with other plant operations
5. require lowest installation cost
6. maintain maximum product storage space
7. be readily accessible for maintenance without interruption of cold room operation
8. provide most efficient combination of above features

Other important considerations are uniform air distribution, and air turbulence without blast effects on the box men.

King engineers are always ready to advise operators of freezer or storage plants on the best procedure for any particular problem. This service is provided at no extra cost to users of King Sharp Freeze Systems.

50 years of experience is at your service

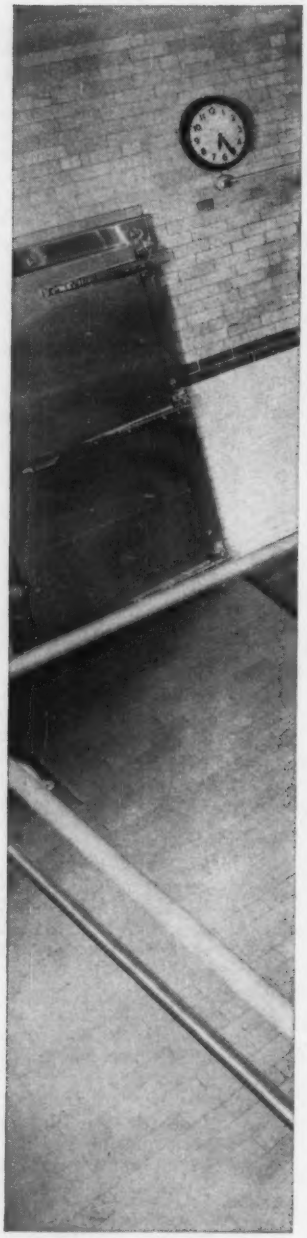
SHARP FREEZE SYSTEMS

King COMPANY OF OWATONNA

905 Cedar St OWATONNA, MINNESOTA

They're justly proud of their fine new pasteurization equipment at Iowa State, supplied by The Creamery Package Mfg. Company fully equipped with Taylor controls. The instrumentation is of particular interest since the system is also used for research purposes.

# Creamery Package sent Taylor to college!



**Adjacent to the CP Swept Surface Heat Exchanger** are two dual controllers (upper left center) providing alternate control systems.

**Upper Controller;** switching from one side to the other is accomplished by a manual three-way valve connecting the air system for the instruments. The left side is a Ratio Controller, in operation when steam is being used in the Atomizing Chamber. On the right is a Vacuum Controller, regulating temperature in the Vaporizing Chamber and used when the Atomizing Chamber is by-passed and the flow is through the SSHE into the Vaporizing Chamber. Each instrument operates the same Automatic Air Bleed Valve located ahead of a Vacuum Pump.

**Lower Controller;** the left side throttles the steam to the Atomizing Chamber, through a HI-FLOW* Valve. This would be used in a standard Vac-Heat operation in conjunction with the Ratio Controller. The right side controls steam to the Swept Surface Heat Exchanger when the Vacuum Controller is in operation. Product then flows from the Flow Diversion Valve through the Heat Exchanger to the Vaporizing Chamber, by-passing the Atomizing Chamber.

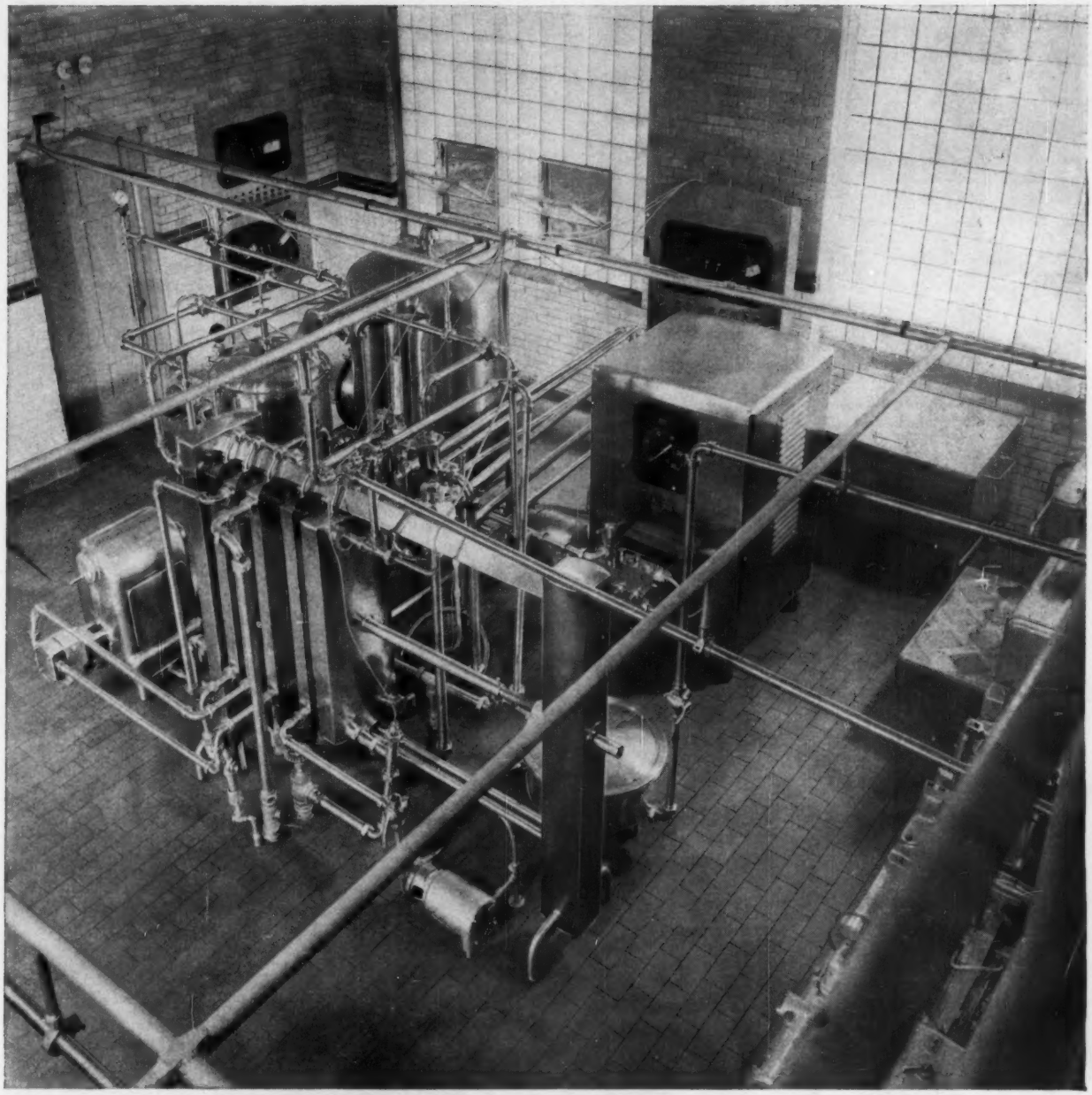
**Dual Controller on CP panel** (upper right center) is a standard Taylor packaged HTST system, providing hot and cold milk temperature records, controlling and indicating hot water temperature and controlling and recording chilled water temperature. Safety Thermal Limit Recorder is set at 162° F.

**On the CP Stainless Homogenizer at right** is a Taylor Homogenizer Pressure Gage.

*When you're installing new equipment or modernizing your plant, remember to specify — "Taylor Equipped as Usual." Taylor Instrument Companies, Rochester, New York and Toronto, Ont.*

*Trade-Mark

*Taylor Instruments*



*Taylor control systems for CP pasteurization and other equipment at Iowa State University*

Taylor-controlled CP equipment used for research
as well as production at Iowa State University

## MEAN ACCURACY FIRST



CIRCLE 107 ON READER SERVICE CARD

20 CANS A MINUTE... *opened, drained and rinsed!*

The new Langsenkamp "101" Can Opener is completely automatic . . . does the work of four men. Depending on the product's consistency, it can open, drain and rinse up to 20 No. 10's a minute. Positively eliminates the chance of can slivers getting into your product.

Ideal for canners, frozen food processors, bakers, or any users of liquid or semi-paste product . . . for any product that will drain through a 4" opening. Provides cleaner, more efficient handling—no loss due to spilling or splashing of product. Equipped with stainless steel underpan 60" x 20" x 15" wide, ¾ hp motor, 806 lbs. net weight, pump optional.

The "101" Automatic Can Opener is one of a complete line of Langsenkamp machines for food processors which also includes manually-operated can openers and automatic can crushers. Write for full details.

**F. H. LANGSENKAMP CO.**
227 E. SOUTH ST. • INDIANAPOLIS 4, INDIANA

CIRCLE 3 ON READER SERVICE CARD


riff–Horsey Ltd., Toronto, will expand present flash freezing facilities to double capacity.

### Associated Industries

**Aluminum Co. of America** has established a graphic design assistance group available for manufacturers and designers. Robert P. Eganhouse heads up the department.

**Archer-Daniels-Midland Co.** will build a multi-million dollar chemical center near Peoria, Ill.

**Celanese Corp. of America** plans to purchase **Plastic Horizons, Inc.**, major independent producer of polyethylene film, with plants in Paterson, N. J., and Batavia, Ill.

**Chas. T. Main, Inc.**, Boston engineering firm, is offering a variety of services to the food processing industry.

**Miles Chemical Co.** is planning construction of a new research center adjacent to present headquarters in Elkhart, Ind. Firm recently broke ground in Cuernavaca, Mexico, for a new fermentation plant.

**Olin Mathieson Chemical Corp.'s** Packaging Div. has a new research v.-p., Milton O. Schur. He is succeeded as R&D director of division's Ecusta Paper operation in Pisgah Forest, N. C., by Dr. David C. Lea.

**Packaging Machinery Manufacturers Inst.** has contributed $10,000 to purchase R&D equipment for new Michigan State U. School of Packaging.

**Thatcher Glass Mfg. Co.** plans to acquire all outstanding stock of **Toledo Mould Co.**, Toledo, O.

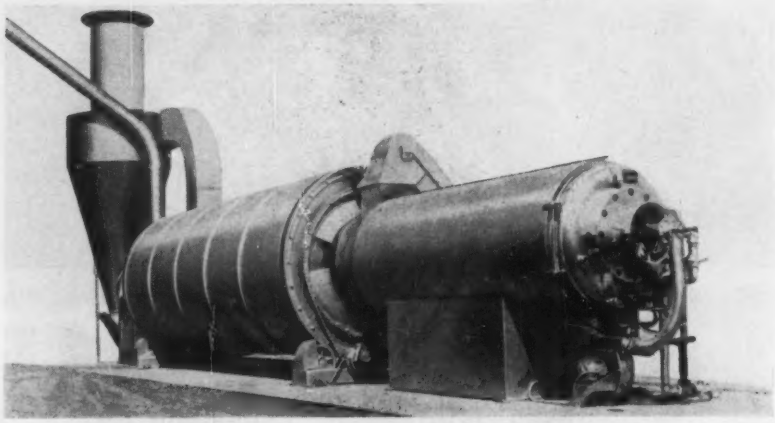
### Deaths

**William H. Ritter, Jr.**, 60, former N.C.A. v.-p.

**Arthur H. Downey**, 62, R&D v.-p., Magnus, Mabee & Reynard, Inc.


**Who wants to cut drying costs?** you do!

**LET HEIL HELP YOU TAKE A "NEW LOOK" AT YOUR DRYING OPERATIONS**



Take a good hard look at the economics of your drying operations, especially if you're operating many small units.

Consider this: a 15,000-lb-per-hour Heil dryer, feeder and grinder costs about 30 percent less than two 6,000 or 7,500-lb-per-hour units. You save on initial investment and still get the same production capacity.

But you save other ways, too. A single larger Heil dryer requires less floor space and horsepower to operate. You can estimate as much as a 10 percent saving in over-all operating costs.

Make sense? Of course it does. Your Heil representative will be glad to look over your drying operations and help you take advantage of cost-cutting improvements a Heil dryer offers. Call him soon.

**THE HEIL CO.**
3000 West Montana Street
Milwaukee 1, Wisconsin

MANUFACTURERS OF THE ARNOLD DRYER

# FE SERVICE CENTER


Catalogs .....p. 124
Books .....p. 126
Patents .....p. 128
Advertisers Index .....p. 131
Classified .....p. 132
Reader Service.....Back of Book


## NEW EQUIPMENT & SUPPLIES

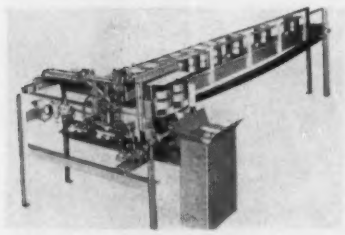
### For Better Dust Control

Redeposit of particles is minimized by counter-flow action in the improved RJ dust filter.

A reverse air plenum maintains porosity of filter sleeves, keeping back pressure and air volume constant. Air-tight, quick-opening inspection doors and a reverse air pressure blower have also been included.

Unit filters light or heavy airstreams of grains, also fine, coarse, abrasive, or non-abrasive dusts with temperatures to 300F. Maker reports efficiencies of 99.9%. Filter capacities: 285 to 6,400 cu. ft. air/min.—*The Day Co.*, 810 *Third Ave., N.E., Minneapolis* 13.

Circle 251 on Readers Service Card



### Large Size-Can Caser

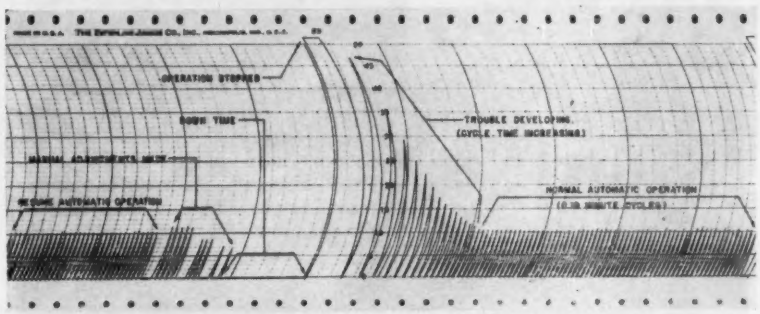
Continuous, automatic, end-loading caser handles single tier loading of such large size cans as #12, #10, 46-oz., 307x710, and 307x700.

Designed especially for relatively low and medium speed operations, Model 10 Non-Shock machine will fill 10 cases of #10 or #12 cans/min., and 7-9 46-oz. cans/min.

Unit allows no free rolling cans. And dented can bodies and split seams are avoided.

Air-operated, the caser consists of feed draper, loading chamber, pusher plate, mechanical support and loading arm, and loading funnel.—*Food Machinery & Chemical Corp., San Jose* 8, *Calif.*

Circle 252 on Readers Service Card




### Recorder Spots Troubles In Process Operations

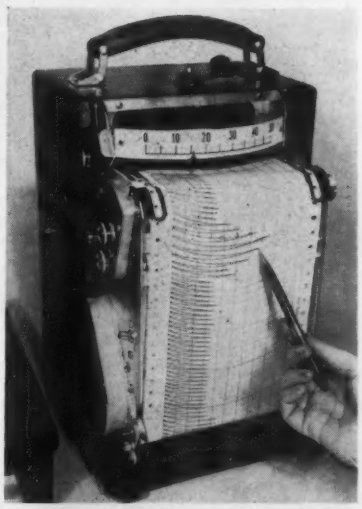
Hidden troubles in machine operations and processes can be spotted with this new portable graphic-recording instrument. It times short-duration events to millisecond accuracy, even at slow chart speeds.

Maker calls it "only instrument of its type for monitoring automated operations that provides split-second timing along with 'time-of-day' information."

Markings at edge of chart (not illustrated) show time of day any event occurs, while sweep of pen across chart indicates duration of event in question. Sample section of chart strip is shown above. It has been imprinted to indicate meanings of the various line scribings.

Adjustments are readily made for different chart speeds, as may be required in specific checks being run. Standard speeds are: ¾ in., 1¼ in., 3 in., 6 in., and 12 in. per hour and per minute. And sweep time scale-ranges of from 1 sec. to 1 hr. are available.

Special charts with scales for measuring speed (as an inverse function of time) are also offered. A chronograph pen also can be added to permit simultaneous recordings of the time other related events occur. Recorder operates on 115v., 60 cycles.—*R. B. Annis Co., 1101 N. Delaware St., Indianapolis 2, Ind.*



Circle 253 on Readers Service Card

### Plastic Conveyor Belt

Polyester-vinyl conveyor belting provides super gloss surface for quick product release, easy sanitation, dimensional stability, chemical resistance, and extra-long life.

Permagloss is stable in 0-275F., carries no taste or odor, and is crack and grease-proof.

Belts are considered ideal for candy, baked goods, and meats.—*Lassiter Corp.*, 350 *Fifth Ave., N.Y.C.*

Circle 254 on Readers Service Card

How United States Testing Company helps

# STOP TROUBLE BEFORE IT STARTS

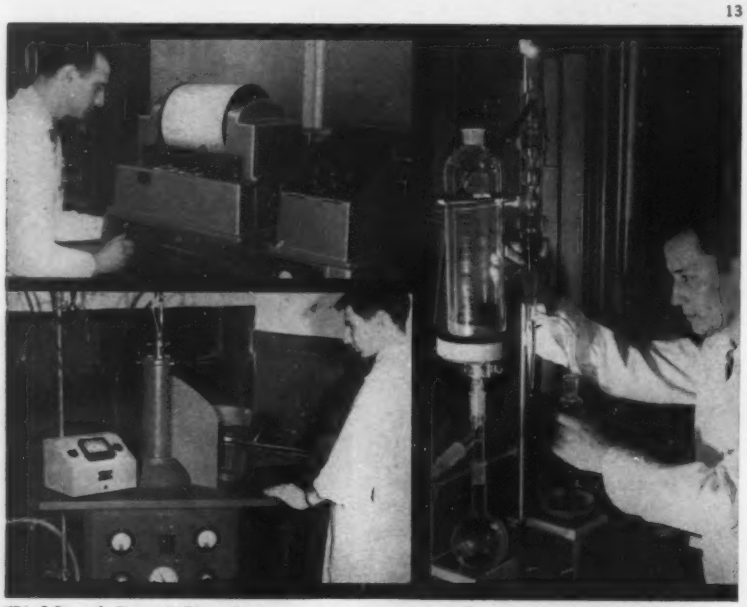
Spotting potential trouble in processes or products...and saving thousands of dollars in damages and lost production... that's only one of many services United States Testing Company offers you.

Take the beverage manufacturer concerned about the strength of his bottles. We selected a large sample—old, new, small, large, filled, and empty ...inspected each for bad scratches, bubbles, striations, and chips... polariscoped to spot internal strain... hydrostatic tested for bursting strength ...and immersed in hot, then icy water to measure thermal shock resistance.

Result: A "spectrum" of data showing exactly his safety and potential danger areas.

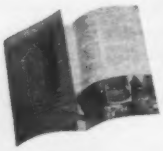
Knowing how to induce failure in the laboratory and prevent trouble in the process or field calls for trained evaluation engineers and diversified facilities. You get both at United States Testing Company. Why not phone or write us about your plant problem?

13



**Fields of Specialization:**

Water Analysis • Pharmaceuticals & Drugs • Chemicals & Natural Raw Materials • Fuels & Oils
Pulp & Paper • Textile Chemicals & Dyes • Paints, Varnishes & Pigments • Soaps & Detergents
Food Products & Additives • Resins, Plastics & Rubber • Physical Chemistry • Metals Chemistry
Microbiology • Plant & Site Inspections • Outdoor Exposures • Agricultural Chemicals & Soils Analysis



*Send for free bulletin describing our evaluation and R/D services*

The World's Most Diversified Independent Laboratory.

**United States Testing Co., Inc.**
1415 Park Avenue, Hoboken, N. J.

**Branch Laboratories** BOSTON • BROWNSVILLE • DALLAS • DENVER • LOS ANGELES MEMPHIS • NEW YORK • PHILADELPHIA • TULSA

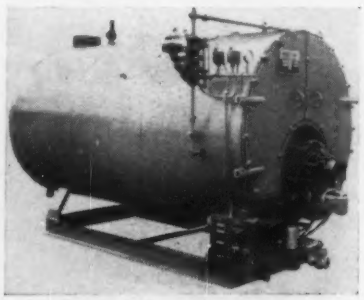
## *Equipment & Supplies*

### Fast-Reading Temp Probe

This new instrument — the Thermi-Tem — speedily measures temperatures of liquids, penetrable masses, and surfaces. Ultimate temperature is indicated in 3 to 10 sec. with an accuracy of 2%.

The temperature scales are linear and available as low as —50F. or as high as 500F. Indicating meter has shock-protected mounting in an anodized aluminum case. Probe, which has 5-ft. lead, comes either straight or with 90 deg. angle.—*Testing Machines, Inc., 72 Jericho Turnpike, Mineola, N. Y.*

Circle 255 on Reader Service Card



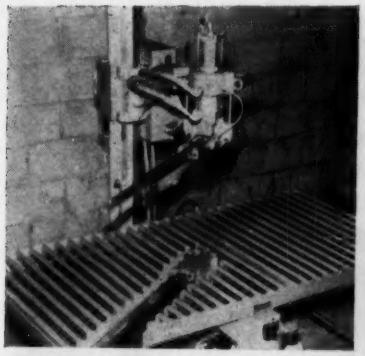
### Compact 'Packaged' Boiler

Models in new line of fully automatic "packaged" boilers — the "Husky" series—range from 10 to 125 boiler hp. Operation on light oil, natural gas, or a combination, may be specified.

Units are of compact 3-phase design. Single motor drives both fan and oil pump. Maker says that forced draft eliminates need for tall stacks or other auxiliary draft equipment.

Enclosed cabinet houses complete operating and flame-safeguard controls. Low-fire start is standard, but full modulation on both oil and gas is available.—*Western Boiler Co., 47 Rousseau St., San Francisco 12.*

Circle 256 on Reader Service Card



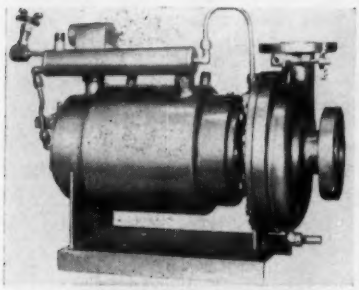
## Staples Cartons 'On Bias'

A dual-unit machine that drives staples at an angle to the direction of carton travel is among special-application staplers newly offered.

Set up as shown in photo, this machine simultaneously closes both tops and bottoms of center-slotted or overlap cartons after they are filled.

The angle closures are made at rates up to 500 cartons/hr. Quickly set control adjusts machine to handle various sizes and shapes of containers. — *International Staple & Machine Co., P.O. Box 270, Herrin, Ill.*

Circle 257 on Reader Service Card



## Pump With Heat Exchanger

An externally mounted heat exchanger for high-temp operations is featured in this new sealless "canned" pump. In addition, there are water jackets around the motor for maximum cooling.

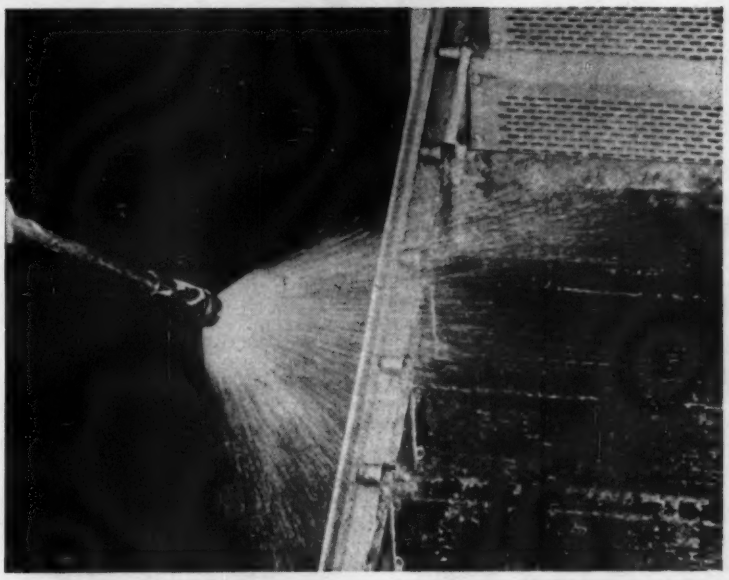
Pump and motor are one unit, and a portion of pumped fluid circulates through motor section between rotor and stator, both of which are "canned" in corrosion-proof, non-magnetic liners.

Unitizing of pump and motor has eliminated need for stuffing boxes or seals, and leakage is reported completely abolished.—*Chempump Div., Fostoria Corp., Huntingdon Valley, Pa.*

Circle 258 on Reader Service Card


The big PLUS + in Oakite

SERVICE · EXPERIENCE · RESEARCH · PERFORMANCE



**Cleans, sanitizes, deodorizes in just one operation**

COMBINING SEVERAL JOBS into one always brings time-saving and cost-cutting results. For instance:

Oakite Chlor-Tergent sanitizes and deodorizes as it *cleans*, completing three operations at one time. With detergent action, it penetrates, loosens, lifts soil free. With chlorine action, it kills bacteria and mold growth fast, stops odor by destroying the source. Surfaces are left thoroughly clean, film-free and sanitary. Cleaning equipment with Oakite Chlor-Tergent guarantees a complete job.

Where chemical sterilization alone is required Oakite Bactericide does the job best! Applied after cleaning, it provides maximum bacteria destruction almost instantly. Bactericide dissolves in hot or cold water—leaves no film on equipment.

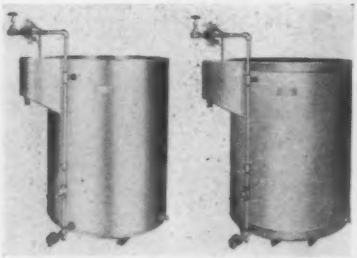
**The big PLUS in Oakite**

Product development is only one of the plus factors you get by working with Oakite. Others include: the personal attention of the Oakite man . . . the vast experience of the Oakite organization . . . information on modern sanitation methods . . . time— and money-saving equipment . . . *guaranteed* performance. Ask your local Oakite man for proof. Or, write for Bulletin F-9414. Oakite Products, Inc., 27A Rector Street, New York 6, N. Y.

OAKITE

SCIENCE

over 50 Est. 1909 years' leadership in industrial cleaning



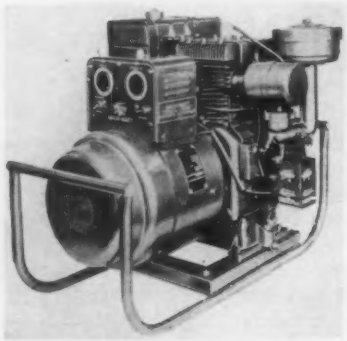
## Steel and Plastic Briners

Newly offered are two new Brinemakers — the Model E-S (left photo) and the Model E-P (right).

Former is fabricated of extra heavy, low-carbon stainless steel to afford greatest durability. Latter is made of heavy virgin plastic-formula material that has been approved by the Meat Inspection Bureau.

Maker notes that lighter-weight plastic unit is translucent, enabling observations of salt supply and liquid level through tank wall.—*Morton Salt Co., 110 North Wacker Dr., Chicago 6.*

Circle 259 on Reader Service Card



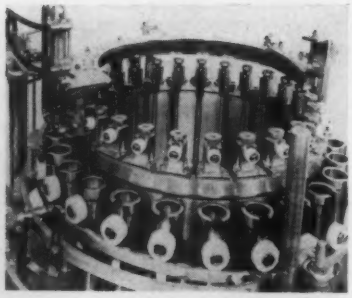
## 'Package' Power Plant

High level of generator power performance stemming from Maxi-Watt design improvement provides maximum power and efficiency.

Rated at 4,000w., generators will start and power a 3 hp. motor under full rated load; or will safely carry a 4,000w. load of lights on a single 115v. circuit; or will carry typical standby loads beyond capacity of ordinary 3,500 or 4,000w. units.

Series is available in electric, manual, or remote starting models. Units come with either carrying cradle or two-wheel dolly for easy portability. — *Wincharger Corp., Sioux City, Ia.*

Circle 260 on Reader Service Card



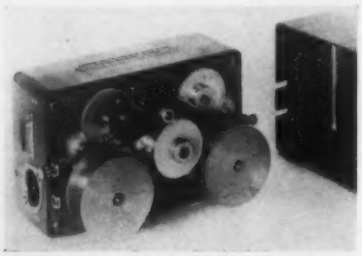
## Monitor Stops Filler Jams

An exclusive "magnetic monitor," now employed on high-speed "Votator" rotary piston fillers, provides new positive valve-action control. Thus, jamming is curbed, along with resulting downtime and repairs.

The new device, incorporating a battery of magnets, is positioned (as seen in photo) over valves of the filler. Cycle action of continuous magnetic field assures that proper valves are opened fully and held open until piston's filling stroke is completed.

In photo, unit is seen holding two valves open (at '11 o'clock' position). As device declines (at right), it assures smooth, continuous control over valves until they are fully closed.—*Girdler Process Equip. Div. of Chemetron Corp., Louisville, Ky.*

Circle 261 on Reader Service Card



## Compact Tape Unit

New 8-channel time-base, punched-tape unit for automatic programming — the Model TP-860 — is completely self-contained in compact 5x8x6-in. "package." And included is space for storing reels.

Provided by this model is 20 min. of programming at standard tape speed of 1 in./sec. Unit has a forward drive and automatic rewind, with separate motors for each operation. It uses standard teletype punched tape.—*Anaheim Electronics Div., Electronics Eng. Co. of Calif., 1601 E. Chestnut Ave., Santa Ana, Calif.*

Circle 262 on Reader Service Card

*in packaging*

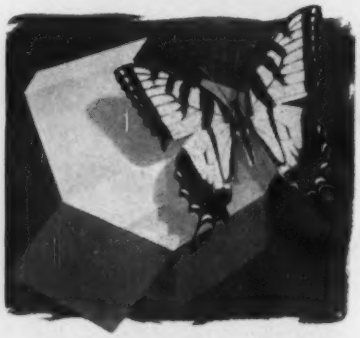
**Weyerhaeuser**

(Ware'-hous-er)

*is pronounced*

**Ingenuity**

(In-je-nu'-i-ti)



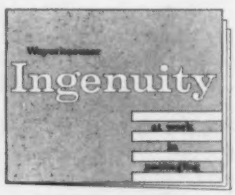
**If there were a popular demand for butterfly wings, Weyerhaeuser ingenuity would package them to give you a selling advantage**

Weyerhaeuser knows packaging from the ground up—from the tender shoots of tiny saplings to the whims that ring cash registers. Weyerhaeuser boxboard plants supply quality materials with which specialists work in creating sales-building inducements to influence shoppers.

At Weyerhaeuser, knowing *what* folding carton to make is just as important as knowing how best to make it for user convenience . . . product protection . . . distributor and dealer approval . . . visual appeal. Working as a team, the Weyerhaeuser group welcomes packaging problems. For advanced thinking in *your* folding cartons . . . write Weyerhaeuser.

**REQUEST NEW "INGENUITY" BOOKLET**

This booklet can give you a new concept in packaging. See why working-with-Weyerhaeuser is the answer to folding cartons.




**Weyerhaeuser Company**

**Boxboard and Folding Carton Div.**

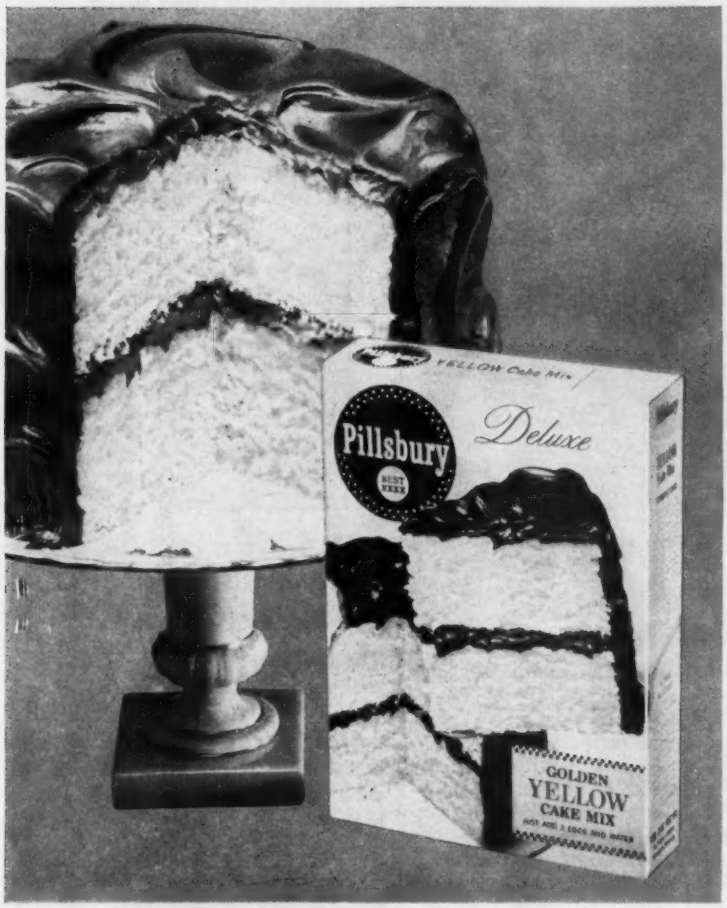
**Headquarters 919 N. Michigan Ave., Chicago 11, Ill.**

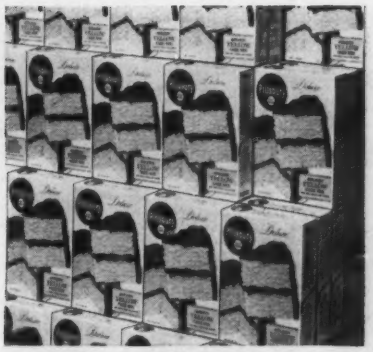


CIRCLE 112 ON READER SERVICE CARD

# How Weyerhaeuser Cartons Help Pillsbury Maintain Leadership

Pillsbury products in Weyerhaeuser cartons please over 20 million shoppers every month!



**ASSURED PERFORMANCE.** Over a billion Weyerhaeuser packages have rolled out of Pillsbury plants, protecting and selling an ever-growing and appetizing variety of popular Pillsbury products.

**STRICT QUALITY CONTROL.** At Pillsbury's Hamilton, Ohio plant, the Paper Analyst shows laboratory sample-test results to the Chief Materials Control Chemist and Weyerhaeuser's Technical Director. Close cooperation such as this assures the finest packages.

**INTERESTING NEW FOLDER.** Describes the extensive tests and inspections Weyerhaeuser cartons pass as daily routine at Pillsbury. We'll be glad to send you a copy.

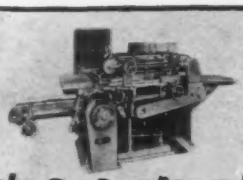
**What** does Pillsbury want—*and get*—from Weyerhaeuser? Exact reproduction of photographs . . . precise color-fidelity . . . full conformance with established high standards . . . uniformity for swift filling and closing. Satisfying customers such as Pillsbury, when the chips are down, calls for ingenuity, marketing acumen, the closest kind of cooperation, and production facilities such as Weyerhaeuser's big 5-color presses and the almost infallible electronic color inspection. These, too, can be yours when you work with Weyerhaeuser in solving your packaging problems.

In packaging **Weyerhaeuser** (Ware'-hous-er) is pronounced **Ingenuity** (In-je-nu'-i-ti)

## Weyerhaeuser Company

Boxboard and
Folding Carton Division

**Headquarters:**
919 N. Michigan Ave., Chicago 11, Ill.



"WE RECOMMEND THIS LUBRICANT TO OUR CUSTOMERS"

—says PACKAGE MACHINERY COMPANY
Springfield, Mass.

"We have found LUBRIPLATE Lubricants to be very effective and use them extensively in our machines. To assure the proper use of LUBRIPLATE Lubricants for re-lubrication, we place tags on our machines before shipment. Thus the purchasers of those machines know the LUBRIPLATE Product we recommend for each application and where to obtain it."

**REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE GREASE AND FLUID TYPE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE COSTS.**

LUBRIPLATE is available in grease and fluid densities for every purpose . . . LUBRIPLATE H. D. S. MOTOR OIL meets today's exacting requirements for gasoline and diesel engines.

For nearest LUBRIPLATE distributor see Classified Telephone Directory. Send for free "LUBRIPLATE DATA BOOK" . . . a valuable treatise on lubrication. Write LUBRIPLATE DIVISION, Fiske Brothers Refining Co., Newark 5, N. J. or Toledo 5, Ohio.

## Equipment & Supplies

### Fast 1-Man Pallet Loader

On this one-man pallet loader, any palletizing pattern can be used. And high-speed operation enables loading of up to 24 bags/min.

Called "link between conveyor and fork truck, the unit comprises a powered turntable station that keys in with operations of flexible loader and swivel stacker. Bags are power-propelled into position on pallet, with operator guiding bags into desired pattern.

When pallet is loaded, table rotates to position a new pallet, while loaded unit is removed by fork truck. If required, bags can be glued automatically to prevent their shifting. — *Power-Curve Conveyor Co., 2185 S. Jason St., Denver 23.*

Circle 263 on Reader Service Card

### Multi-Area Temp Monitor

Called particularly advantageous for refrigerated and air-conditioned buildings—especially low-temp food storage facilities—new Type-Z monitor system provides centralized observation of ambient temperatures in multiple areas.

The unit covers the broad range between —50F. and 300F. Selector switches on monitor panel provide for calibration and room selection, with confirming indicator lights mounted adjacent.

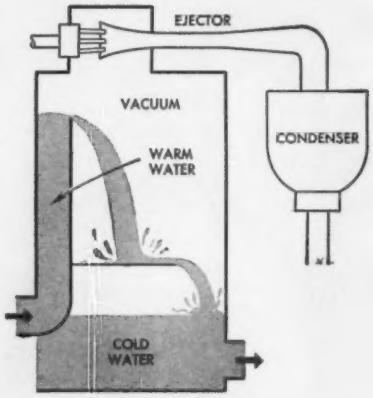
Temperatures appear directly on an indicating instrument—accurate to ±1% of scale reading. Included in "package" are sensor probes (plug-terminated types), plus mating extension cables to permit runs as long as 4,000 ft.

Cables plug into rear of panel, thus simplifying maintenance checks. Central power supply of unit operates on 115v., 60-cps., and draws 4w. — *Royco Instruments, Inc., 365 San Antonio Rd., Mountain View, Calif.*

Circle 264 on Reader Service Card


# NEED COLD WATER?

**Beat the heat with steam-jet cooling!**



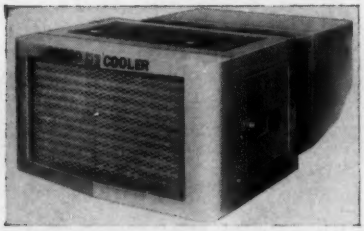

Simplified schematic diagram of steam jet cooler with surface condenser.

The simplest, most economical way to cool water is to use an Ingersoll-Rand Water-Vapor Refrigeration Unit with a steam-jet cooler. In this system, water is the only refrigerating medium. It *cools itself* by direct evaporation in a high vacuum created by steam-jet ejectors. The small portion of water that is evaporated gives enough cooling effect to chill the remainder.

I-R builds steam-jet coolers in sizes from 30 to 1200 tons and larger, for chilled water temperatures down to 35°F, with steam pressures as low as 2 psig. For more information write today for Bulletin 9143-B.

Ingersoll-Rand

4-998 ♥ 11 Broadway, New York 4, N. Y.



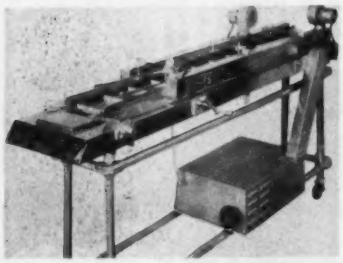
## Streamlined Truck Chiller

For heavy duty, yet light in weight (376 lb.), new compact Model C-10-B truck-powered refrigeration unit is called specially suitable for maintaining proper temperatures of packing house products, milk, and dairy items in delivery runs.

Unit will serve insulated bodies up to 18-ft. long. Another model (CE-10-B) is available for dockside or other standby operation.

Cooler is "factory packaged" to mount through a prepared opening in upper front wall of truck body. Unit includes all components except compressor, which is separate unit that fits on truck engine for driving by V-belt from crankshaft. *—Hunter Mfg. Co., 30525 Aurora Rd., Cleveland (Solon) 39, Ohio.*

Circle 265 on Reader Service Card



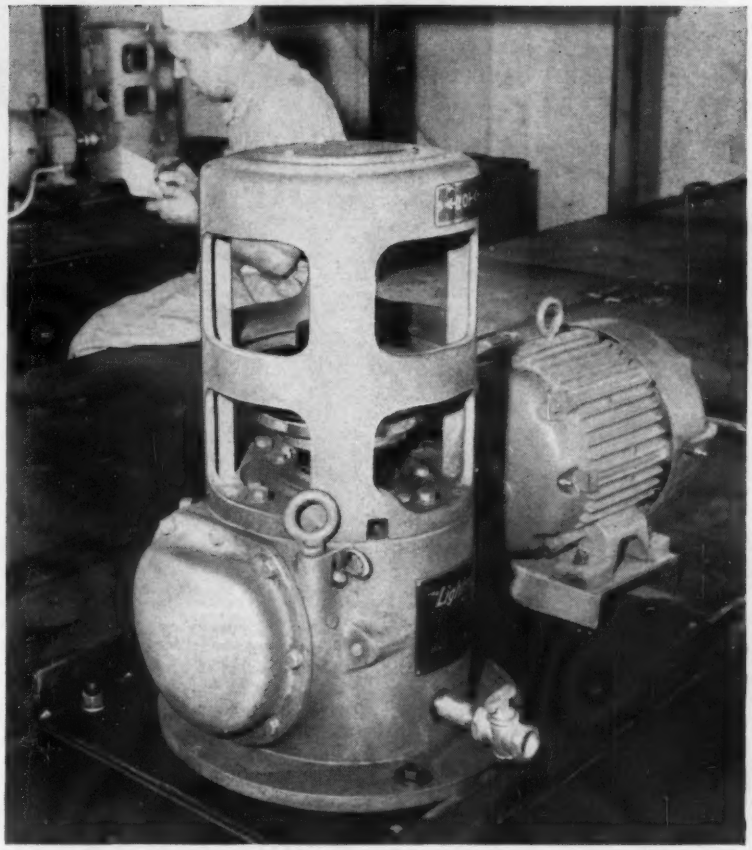
## 'El Rancho' Meat Packager

Semi - automatic packaging of stack - packed thick - sliced bacon, franks, sausage, and other meat items in "El Rancho" cartons is provided with this GLM 3,000 machine.

Package, web construction, has full end panels to which are applied a special adhesive. On line, product is placed on U-board, tray, or backing board, and this unit is then slipped into carton end.

Web corners tuck in and panels are brought in place. Fed to new machine, package's adhesive is activated and set. Convenient tear flap allows easy accessibility to product. *—Marathon Div., American Can Co., Menasha, Wis.*

Circle 266 on Reader Service Card



*Stirring chocolate* for ice-cream coatings is a pushbutton operation at Ambrosia Chocolate Company, Milwaukee.


## How to stir 37 tons of hot chocolate

This man is sitting on 37 tons of hot chocolate.

The chocolate has to stay hot—first here, then in heated tank trucks—until it gets to a customer's plant, where it will coat nearly two million ice-cream bars.

That means it has to be stirred so it won't settle or stick to the sides of the tank. It mustn't overheat, even around the edges. It must be ready to flow through a pipe fast enough to load a 30,000-lb. truck in 20 minutes.

LIGHTNIN Mixers like the one you see here have handled this critical job without a hitch for four years. There are 16 of them on big storage tanks throughout the plant.

In four years the mixers have needed no repairs—just normal maintenance. Their squat design allows for maximum tank height. The stainless turbine impellers are easy to clean.

You can get standard LIGHTNIN Mixers like these to handle your bigger mixing jobs in virtually any size of tank. They come as big as 500 hp and in hundreds of power-speed combinations. The mixing results are *unconditionally guaranteed.* For details, see your LIGHTNIN Mixer representative (listed in Thomas' Register).

Or write us.

*Lightnin® Mixers*

MIXCO fluid mixing specialists

**MIXING EQUIPMENT Co., Inc., 143-g Mt. Read Blvd., Rochester 3, N.Y.**

*In Canada: Greey Mixing Equipment, Ltd., 100 Miranda Ave., Toronto 19, Ont.*

For the

# Cleanest, Most Effective Insect Control

Fog with

DYNA-FOG
TRADE-MARK

Insecticide Applicators

Check these important points which Dyna-Fog equipment gives with your present method of insect control:

- Only clean-up necessary is exterminated insects.
- Penetrates remote areas where insects hide and breed.
- All equipment is fully guaranteed for one year.
- Dyna-Fog has the only full line of fogging equipment—the leader in the field.

Curtis AUTOMOTIVE DEVICES, INC.

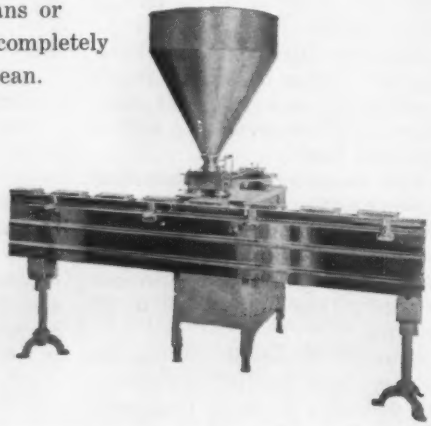
P.O. Box 297-12 Westfield, Indiana

CIRCLE 10 ON READER SERVICE CARD

For inexpensive filling . . .

the **SIMPLEX** TWIN

Top efficiency with this fully automatic Simplex Model T. A universal machine to handle cartons, cans or jars. No can no fill, completely adjustable, easy to clean.



Fills 25 to 80 containers per minute! Range from 2 oz to a gallon! Handles liquids and semi-solids!

Write for circular on this 2-piston model and other Simplex fillers. Dept. FE.

F. L. BURT COMPANY

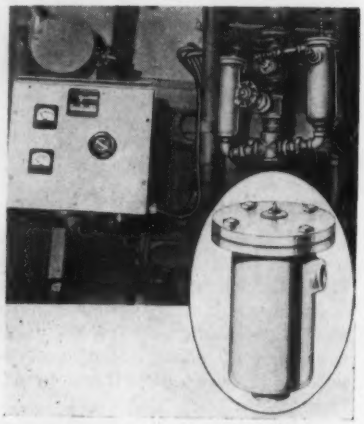
571 7TH ST.—SAN FRANCISCO 3, CALIF. PHONE KLONDIKE 2-2020

Name .....

Address .....

City .....State .....

## Equipment & Supplies



### New Water Chlorinator

New electrical chlorinating unit for purifying water used in wash-down sanitation automatically makes and feeds its own chlorine.

Thus eliminated is bother of handling and storing chlorine cylinders or working with chemicals. Maker says equipment requires virtually no maintenance and cathodically protects all metallic equipment.

Unit consists of power supply

Mr. Du SAYS:

In food plants, we lift grease and soil

We clean to beat the band

We do your work, we clean, we toil . . . we automate instead of hand.

DuBois Chemicals

AUTOMATION PLAN

Did you know that your sanitation program can be automated? DuBois has the products, equipment and know-how to install this program. 95% of cleaning cost is labor. But, DuBois cuts these costs sharply. At a large canner, we're helping them save 42½%.

Get more data from your DuBois Representative, listed in Yellow Pages under "Cleaning Compounds".

40 years of cleaning experience at your service.

DuBOIS CHEMICALS, INC.

Broadway at 7th • Cincinnati 2, O.

CIRCLE 11 ON READER SERVICE CARD

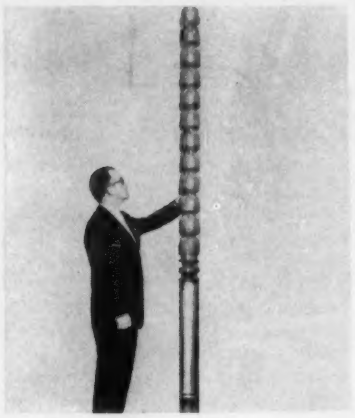
 CIRCLE 116 ON READER SERVICE CARD

and patented hypochlorite cell. It installs on discharge side of pump, with connection to any 110-120v. a.c. outlet.

Brine solution employed passes through hollow anode of cell and through outer space between anode and case (cathode). During this passage, brine is converted to sodium hypochlorite, which is fed to main wash-down water stream.

Concentration of chlorine is controlled by altering current, salt concentration, or flow rate through cell. Photo shows installation, along with closeup (inset) of unit. *—Ster-O-Matic, Inc., 400 W. Madison St., Chicago 6.*

Circle 267 on Reader Service Card



## 'Bowl' Pump for Deep Wells

Series UF turbine bowl submersible pumps are specially suitable for industrial plants requiring large volumes of water from 6-in. or larger deep wells.

Models are offered in 16 sizes from 5 to 40 hp. and with capacities up to 180 gpm. from well depths to 1,450 ft. Maker states units afford considerable savings in first cost, installation, and operating expenses.

Varying in number from 2 to 23, depending on well depth, the bowls in the assemblies (see photo) are of heavy cast-iron with corrosion-resistant baked-on alkyd melamine finish. Impellers are of bronze and fastenings of stainless steel.

Heavy stainless shaft, coupling, and intake screen are designed to abolish corrosion problems. Tandem bearings located in each stage are of loaded bronze with cut-less rubber (Goodrich). Units may be readily dismantled for inspection and repair.—*Gould Pumps, Inc., 208 Black Brook Rd., Seneca Falls, N. Y.*

Circle 268 on Reader Service Card

## How Neptune Syrup Meter

# PAID OFF TWO-TO-ONE

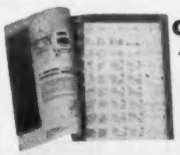
### in first year at J. Hungerford Smith

By permitting purchases of caramel color at tank-car prices, a complete storage and metering system paid for itself twice over in materials costs alone during the first summer. And this is only part of the savings made by J. Hungerford Smith Company, manufacturer of fine root beer flavors.

Formerly, the caramel color was purchased in drums, requiring much man-handling and storage space. It took a man full time to measure the syrupy material with buckets. Now it takes only a few seconds for each batch. The operator simply sets up the Auto-Stop and opens the valve. The meter does the rest... shuts off automatically at the exact quantity required by the formula. The meter even turns the pump on and off.

Biggest advantage of all, according to Mr. W. Carvel Martin, plant manager: "It takes the guesswork out of the formula."

You can make savings like this in your plant.

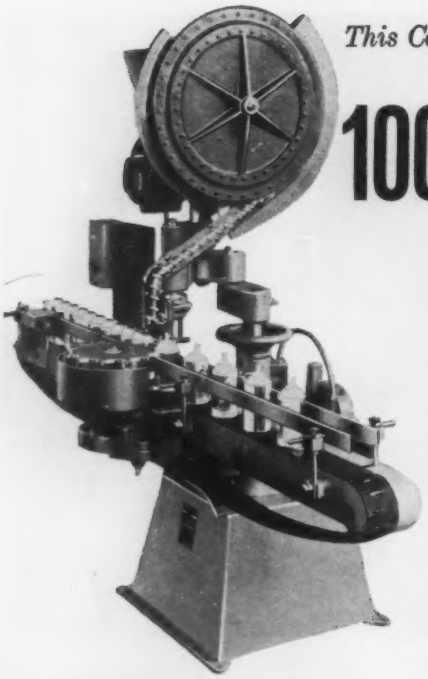


**GET THE FACTS**
*Ask for helpful Meter Data Bulletin 566 LF See Neptune Data Pages in Chemical Engineering Catalog.*

neptune

**NEPTUNE METER COMPANY**
LIQUID METER DIVISION
47-25 34th St., Long Island City 1, N.Y.

Branches in:
ATLANTA • BOSTON
CHICAGO • DALLAS • DENVER
LONG ISLAND CITY
LOS ANGELES • LOUISVILLE
PORTLAND, ORE.
NO. KANSAS CITY, MO.
PHILADELPHIA (Bala Cynwyd)
SAN FRANCISCO (Millbrae)
Canada: Neptune Meters, Ltd.,
TORONTO 14, ONTARIO



*This Capem H-O-FV applies more than*

# 100 AEROSOL VALVES A MINUTE.....

The CAPEM H-O-FV sorts and applies aerosol valves at speeds in excess of 100 a minute in modern plants like Reddi-Wip, Los Angeles, and Rich Products Corp., Buffalo, N. Y. Stainless steel and chrome-plated parts are used whenever dairy industry regulations require. Electric switch gear is mounted conveniently above conveyor for easy washing at shut-down time. Simple changeover from one container size to another.

For full information on the CAPEM H-O-FV and other Consolidated packaging machinery, write: Sales Manager, Consolidated Packaging Machinery Corp., 1400 West Ave., Buffalo 13, N. Y.

*(A Subsidiary of International Paper Co.)*

**CAPEM** THE MODERN SCREW CAPPER

CIRCLE 12 ON READER SERVICE CARD

# NOW SPRAY DRYING NOZZLES WITH ● CERTIFIED PERFORMANCE FROM DELAVAN

WORLD'S LARGEST NOZZLE MANUFACTURER

Delavan's new SDL and SDS nozzles provide an economical and uniformly reliable method of atomizing for spray drying. The special design features of this nozzle bring you improved performance, easier installation, longer nozzle life, and reduced maintenance.

**CERTIFIED PERFORMANCE**

Delavan orifices and distributors are accurately calibrated and certified to operate within ± 5% of rated capacity when tested on water at 1000 psi. All spray angles are certified to be within ± 5° of rated spray angle. This accurate quality control is your assurance that every Delavan orifice and distributor, whether purchased as a set or individually, will perform as rated in the catalog.

**EASY NOZZLE ASSEMBLY**

No special tools or fixtures are required for the assembly or dis-assembly of Delavan nozzles. The orifice and distributor are held securely in position by a screw pin which is easily removed for cleaning or replacement. This feature reduces nozzle maintenance costs.

**WIDE CHOICE OF CAPACITIES AND SPRAY ANGLES**

Delavan nozzles are available in a full range of flow rates and each flow rate can be furnished as standard in four different spray angles. Matching flow rate and spray angle in your dryer can often mean greater efficiency and a better end product.

DELAVAN Manufacturing Company
WEST DES MOINES, IOWA

Gentlemen:
Please send me a copy of your Spray Drying Catalog.
I understand there's no obligation.

Name

Company Name

Address

City Zone State

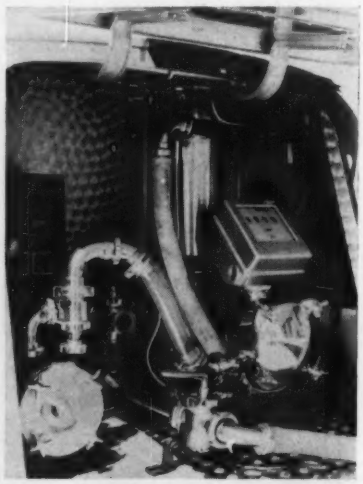
## Equipment & Supplies

### Long-Reach Vac Cleaner

Commonly inaccessible areas are cleaned in a jiffy with this new "4-Star" industrial vacuum unit—with operator working conveniently from the floor.

Both intake and blower are in head of cleaner, which combines wet and dry pickup. A feature is ready conversion to disposable inside bag operation.—*General Floorcraft, Inc., 3630 Bombouts Ave., Bronx 66, N.Y.*

Circle 269 on Reader Service Card

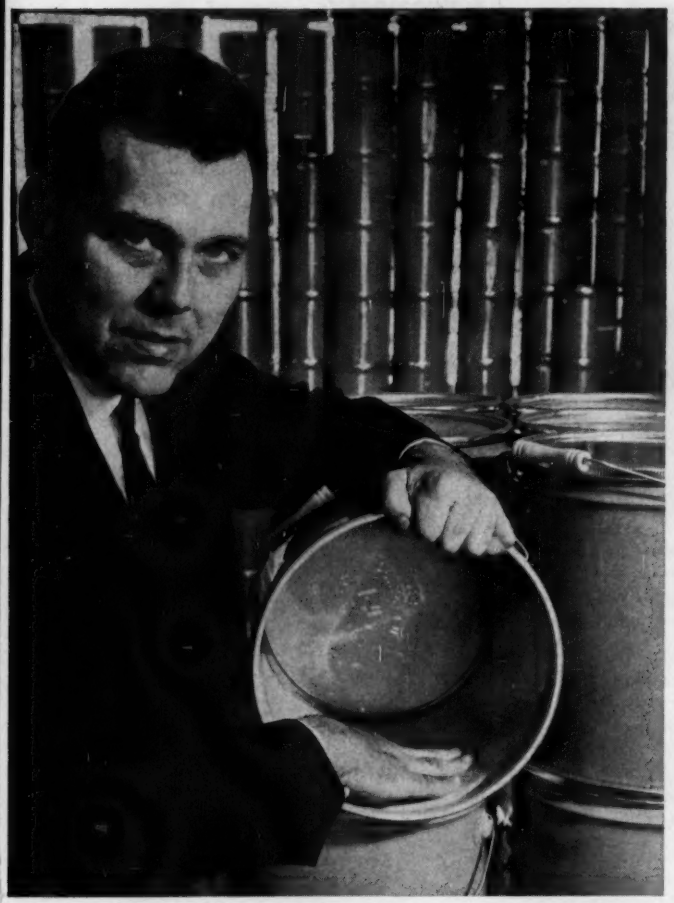


### Meters Bulk-Tank Milk

Now available is this complete system for measuring milk taken from individual bulk farm tanks.

Designed to be mounted in rear compartment of processor's pickup truck, equipment also includes an

## FOR J. HUNGERFORD SMITH'S SYRUPS AND FRUITS...



Robert E. Fleming, vice president and sales manager of J. Hungerford Smith Company, points to lining in J&L steel container which affords "inside protection" to his company's syrups and fruits.

These exotic Maraschino cherries will arrive . . . anywhere . . . as fresh and flavorful as when they were packed in J&L open-head, five gallon lined-steel pails. Special double-coated linings and ring seals lock the goodness in . . . keeps contamination out.

# *Protection Must Be An Inside Job, Too!*

Protection from the *inside* . . . insuring original flavors and freshness . . . is just as important to the world's largest manufacturer of soda fountain fruits and syrups, as is protection from external damage in transit.

To get this vital two-way protection, the J. Hungerford Smith Company, Rochester, N. Y., relies on J&L lined-steel containers for more than 100 of their products, including Maraschino cherries, chocolate syrup and flavorings for ice cream. Robert E. Fleming, vice president and sales manager, sums up the company's confidence in J&L containers: "We can guarantee arrival in perfect condition of shipments to any part of the country by using J&L lined-steel containers." No matter where the product is shipped . . . or how long it remains in the container . . . the special double-coated linings and ring seal closures, plus the strength of steel, keep the contents completely free of contamination.

This reliance upon J&L lined-steel containers is shared by processing companies throughout the world. A J&L container specialist will be happy to discuss your container problems with you in confidence. *Jones & Laughlin Steel Corporation, Pittsburgh 30, Pennsylvania.*

J&L STEEL

**Jones & Laughlin Steel Corporation**

CONTAINER DIVISION

3 Gateway Center, Pittsburgh 30, Pa.

This Steelmark identifies products made of steel. Place this mark on your products. And—look for it when you buy.

Steel

*For prompt, dependable delivery call one of the nine J&L Container plants nearest you.*

ATLANTA • BAYONNE • CLEVELAND • KANSAS CITY, KAN. • LANCASTER • NEW ORLEANS • PHILADELPHIA • PORT ARTHUR • TOLEDO

# Get more blending in less space...

## SIX MERCHEN FEEDERS IN 120 SQUARE FEET

Compact W&T Merchen Feeders are easy to install and operate in crowded areas—can even be ceiling-hung. Space requirements are kept to the minimum without sacrificing precise control.

W&T Merchen Scale Feeders allow more efficient use of existing plant space. Without spending money for new space, you can increase production . . . regulate yield . . . control quality. By installing Pneumatic Merchen Scale Feeders, you get centralized control as well as recording and totalizing of production.

And your product quality is insured by the minute-to-minute accuracy of these feeders . . . each formula ingredient is accurately fed by weight into your blend.

*Learn how you can save space and money with W&T Merchen Feeders. Write to Dept. M-43.37*

WALLACE & TIERNAN INCORPORATED
25 MAIN STREET, BELLEVILLE 9, NEW JERSEY

# WATER ISN'T CHEAP ENOUGH TO WASTE

W&T controlled chlorination saves water and lowers treatment costs. You get maximum water value and use...even reuse.

*Write for details on the new V-notch chlorinators: address Dept. S-137.37*

WALLACE & TIERNAN INCORPORATED
25 MAIN STREET, BELLEVILLE 9, NEW JERSEY




automatic device for taking samples of each farmer's milk.

Operation is activated by push of a single button after hose between bulk tank and truck is connected. Remainder of action is automatic. And when farm tank is finally emptied, amount of milk pumped is read on meter and sample will be in sample bottle. — *T.E.A., Inc., 141-21 72nd Ave., Flushing 67, N. Y.*

Circle 270 on Reader Service Card

## New Heavy-Duty Scales

Heavy duty general purpose weighing operations are targeted with development of new line of platform-type bench scales.

Designated Type 9600, units are designed to maintain continued accuracy under prolonged industrial use.

Scales come in four different capacities: 50 lb. with 1-oz. graduations, 100 lb. with 2-oz., 200 lb. with 4-oz., and 300 lb. with 8-oz. Sealed no-glare dial chart has 20¼-in. overall dia., a 15-in. dia. reading line, and large black figures for easy reading.

A quick tare device, permitting 25% of dial capacity to be tared off, can be provided. And parcel post dial charts are also available.

Units may be made portable (upper right in photo) with special 4-wheel rolling stand. Latter allows 1-in.-increment height adjustments of weighing platform above floor, ranging from 25 in. to 31 in. —*The Exact Weight Scale Co., 541 E. Town St., Columbus 15, Ohio.*

Circle 271 on Reader Service Card

# New Techniques In Equipment Cleaning:

FILLERS
BLANCHERS
COOKERS
AUTOCLAVES
KETTLES
VATS-TANKS
EVAPORATORS
PASTEURIZERS

KLENZADE

# KLENZADE
## SANITATION PROGRAMS

### HC-8 CHLORINATED
**Alkaline Detergent**

Designed for heavy duty soil removal on all food processing equipment. Converts heat-hardened solids into more soluble form through chemical reaction. Chlorinated for improved detergency. Exceptionally effective on animal or vegetable fats.

### FLASH-KLENZ
**Organic Acid Detergent**

Neutralizes and dissolves baked-on deposits. Excellent for de-liming and penetrating mineral-bonded soils. Keeps equipment film-free and restores original lustre of surfaces. Non-corrosive. Extra efficient in problem water areas. For alternate use with Flash-K'leen.

### KLENZADE XY-12
**Sodium Hypochlorite Sanitizer**

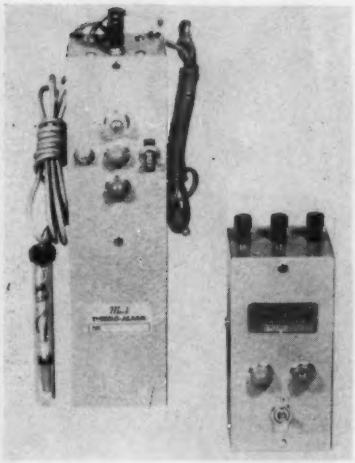
Powerful bactericidal action, yet safe for all food handling equipment. Backed by over 25 years of popularity in food operations. Clear liquid easy to mix in use dilution. Leaves no sediment or residue. Stable; excellent keeping quality; high strength.

*Ask About Our Sanitation Surveys*

**KLENZADE PRODUCTS, INC.**

*Systematized Sanitation All Over the Nation*

**BELOIT, WISCONSIN**

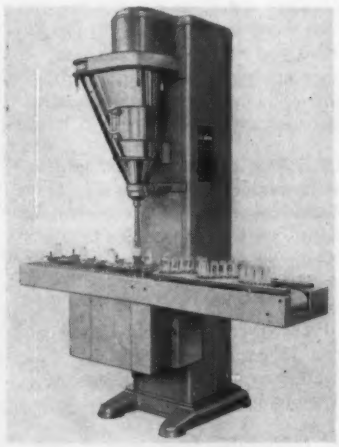
## Unsafe-Temperature Alert

Here's a readily installed electric system that gives visual and audible warnings of unsafe temperatures in refrigerators, freezers, and like units holding perishables.

Employing a factory-preset mercurial thermostat, unit plugs into any 115v. a.c. circuit. Auxiliary battery insures action in event of power failure.

In operation, a green light shows safe temperature, an audible signal and amber light warn of unsafe high temperature, and a red light indicates unsafe low temperature.—*Mack Electric Devices, Inc., Wyncote, Pa.*

Circle 272 on Reader Service Card



## Versatile Automatic Filler

Model EG-6 automatic unit steps up production and reduces unit costs in filling wide range of dry products into almost any rigid container.

Quick changeover of three different filling methods is provided

**BY simply removing a cross wire or two with a pair of pliers, you can take out, add to or replace one or more sections of La Porte Belts. It takes only a few minutes and the belt need not be taken from the La Porte Drive Sprocket. The cross wires are readily replaced and downtime is held to a minimum.**

**But there are other money-saving advantages of La Porte Flexible, open-mesh construction. It speeds up drainage, it facilitates sterilizing with a steam gun. It permits the circulation of air and liquids around products in process. And prevents products from rolling off. La Porte Belts are built for long service and are easily installed.**

***If you freeze, can, dehydrate, pickle, package, store or ship food, it will pay you to use La Porte belts. Available in ½" x 1", or 1" x 1" in any length and practically any width. Ask your mill supplier or mail coupon for illustrated literature and prices.***

**MAIL COUPON TODAY**

**LA PORTE MAT & MFG. CO.**
Box 124
La Porte, Indiana

**Please send free literature on your Conveyor Belt.**

NAME_____

ADDRESS_____

CITY_____ STATE_____

stops sticking

speeds packaging

cuts cleanup

saves money

# SLIPICONE

## silicone release agent

*"wherever sticking is a problem"*

SLIPICONE® goes on in a breeze . . . makes any surface slick . . . keeps adhesives, packaging materials and foods from sticking or piling up where you don't want them . . . keeps equipment cleaner, more sanitary . . . assures neat, attractive packages and labels.

SLIPICONE is nontoxic . . . safe to use in contact with all foods. Stays effective over a broad temperature range . . . from 40 below to 400 above zero!

**SPRAY OR WIPE IT ON**

SLIPICONE comes in four handy sizes: 12 oz. aerosol can; 2 and 8 oz. tubes; 10 lb. can . . . all economical to use.

Get SLIPICONE from your paper merchant, packaging materials supplier, or write Dept. 3707 for name of nearest distributor.

first in silicones

**Dow Corning CORPORATION**

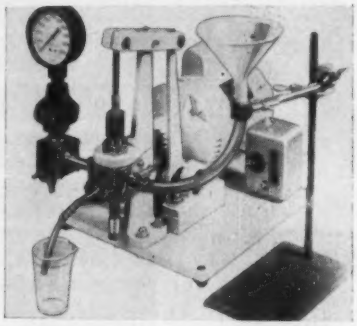
MIDLAND, MICHIGAN


## Equipment & Supplies

for cans, jars, cartons, bottles, and boxes. Unique serpentine feed conveyor handles odd-shaped containers.

Long and short runs at speeds to 50/min. in sizes 1x1x½-in. to 4½x4½x8-in. are possible. Adjustable cam volumetric, volumetric packing, and vacuum volumetric filling methods are used.—*FMC Packaging Machinery Div., 4992 Summerdale Ave., Philadelphia 24.*

Circle 273 on Reader Service Card



### Portable Lab Homogenizer

Model C-8 laboratory homogenizer is new portable, miniaturized, high-pressure unit of marked ruggedness. Maker says it's capable of processing samples as small as 1 oz., with results equal in quality to work of production-size models.

Unit handles runs up to 8 gal./hr. Included is chemical-type pressure gage, plus automatic safety shut-off controls. Optional accessory is a thermostatically regulated heater for prewarming homogenizing head.

All contact parts are of 18-8 stainless steel. And homogenizing head is easily removed for cleaning and sterilizing.—*C. W. Logeman Co., 633 Bergen St., Brooklyn, N. Y.*

Circle 274 on Reader Service Card

## NEW SUPPLIES

**Lap-End Paste for Can Labeling** is newly offered in high-speed vinyl resin-based form. Tradenamed Cascorez CV-704, it reportedly affords three times the coverage of vegetable types, with fast setting to up machine speeds in working a wide range of label stock, including varnished and plastic-coated grades.—The Borden Chem. Co., 350 Madison Ave., N.Y.C. (275)

**New Membrane Filters,** named S/P PartiCel, are designed to pro-

vide extra fast identification and counting of bacteria in food samples. Of special cellulose material, they come with pore sizes ranging from 0.2 to 10 microns. Smaller particles sieve-through, larger ones remain on surface for direct microscopic examination.—Scientific Products, 1210 Leon Pl., Evanston, Ill. (276)

## INGREDIENTS

**Trough Grease** for bakers, newly marketed, is blended of vegetable oils and shortenings, thus avoids need to watch tolerances of additive-type substances when lubricating for easy dough handling. Maker further cites economy of product.—Mallet & Co., Inc., P.O. Box 474, Carnegie, Pa. (277)

## BRIEFS

**Special Gloss Enamel,** called Glid-Cool, has been formulated for use by food industry on cold, damp surfaces. Providing hard, mold-resistant finish, it's applicable on new or previously painted walls and ceilings of cork, cement, plaster, clay tiles, brick, or wood. Use in meat coolers, storage lockers, and fermentation rooms is particularly recommended.—The Glidden Co., Cleveland, Ohio. (278)

**Self-Cleaning Tank Washer,** for permanent installation in storage units, incorporates solid cone, non-clog nozzles. Known as "Jet Stream," system offers controlled-leakage feature to permit complete draining of food products after storage and full coverage of every surface by cleaning solution. Maker's tank tests show unusually low bacteria counts.—Cowles Chem. Co., Cleveland 3. (279)

**Surface Indirect Air Heaters** are offered for use where common products of combustion, when mixed with air being heated, would be detrimental to materials being processed. Suitable for dairy-product processing, food dehydrating, and the like, units readily fit in air supply ducts to ovens or other equipment utilizing air for heating by convection.—Surface Combustion Div., Midland-Ross Corp., 2375 Dorr St., Toledo 1, Ohio. (280)

*Verdict for Tornado Mill at Kingsmill Foods...*

**VERSATILE**
**EASIER TO CLEAN**
**HIGHER CAPACITY**

The evidence is overwhelming. The exceptionally versatile Stokes Tornado Mill is doing a yeoman job at Kingsmill Foods, according to W. G. Kingsmill, President of the Toronto food processing enterprise.

Used for a variety of grinding and comminuting jobs, the Tornado delivers improved product quality as well as greater product uniformity . . . all along the line. Kingsmill has found that less heat is generated in grinding . . . and product flavor is vastly improved. What's more, wet, sticky products are processed without clogging . . . and there are no special blades required when switching from one product to another.

The new mill moves easily from station to station . . . it's simple to operate . . . and a breeze to clean. Disassembling the rotor for cleaning is now a matter of seconds. Kingsmill also likes the greater surface area afforded by the 360° horizontal screen . . . it gives them more uniform products at higher capacity.

Find out for yourself the many ways the Tornado Mill can help your process. The Stokes representative in your area will be glad to give you all the facts. Why not give him a call today. Or write to us directly.

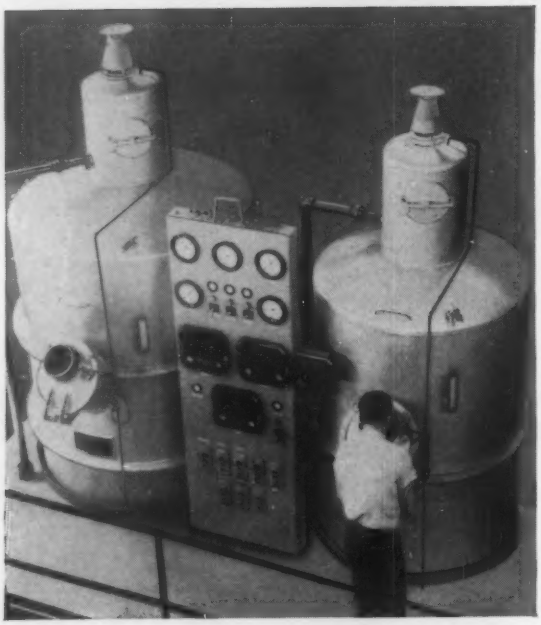
*Size Reduction Division*
F. J. STOKES CORPORATION
5500 Tabor Road, Philadelphia 20, Pa.

**STOKES**




CIRCLE 123 ON READER SERVICE CARD 123

# BUFLOVAK



# Evaporators

## for food products

### tomato pulp, oyster broth, fruit juice, glucose, gelatin

Whatever your material in process may be, Buflovak Equipment will provide the way to the most profitable operation. The right evaporator, selected from a complete range of designs, can be job-tailored for your product. The Buflovak evaporator line includes: Natural and Forced Circulation, Downflow, Agitated Film Roto-Vak, Crystallizers, Calandrias, Single and Multiple Effects. For details, write for Catalog 372, Buflovak Equipment Division, 1631 Fillmore Avenue, Buffalo 11, New York.

*Buflovak Equipment Division*

**BLAW-KNOX**


## JUST OFF THE PRESS

### PLANT ENGINEERING

**Circuit Breaker Load Centers.** Describes line 150-200 amp units. 16p. — General Electric Co., Plainville, Conn. (301)

**Speed Reducers.** Contains photos and selection data of 25 fan-cooled, worm-gear models in over 135 different sizes. 66p.—Link Belt Co., Chicago. (302)

**Bus Ducts.** Includes specs for plug-in, low-impedance, high-frequency and electric utility types. 12p. — Westinghouse Electric Corp., Pittsburgh. (303)

**Boilers & Water Heaters.** Describes portable application features. 4p.—Vapor Heating Corp., Chicago. (304)

**Drives.** Details operation of Select-A-Spede units in sizes ¾-4 hp. 4p. — The Louis Allis Co., Milwaukee. (305)

**Molded V-Belts.** Describes fully jacketed model designed for light-duty transmission drives. 4p.—Raybestos - Manhattan, Inc., Passaic, N. J. (306)

**Blast Freezers.** Introduces line of air-defrost units for low-temp applications such as ice cream hardening, and meat, fish, and poultry storage rooms. 4p.—Vilter Mfg. Co., Milwaukee. (307)

**Dust Separators.** Includes performance data installation photos, and selection charts for Dual-Clone models. 8p.—The Day Co., Minneapolis. (308)

**Thermal Insulation.** Offers guide to best use of thermal insulating materials, emphasizing "economic thickness" approach to specification. 16p.—National Insulation Manufacturers Assn., N.Y.C. (309)

### PROCESSING

**Infrared.** Gives applications and advantages of special heating qualities for food processing. 8p.—The Fostoria Pressed Steel Corp., Fostoria, Ohio. (317)

**Agitators.** Details series of 7 stainless, nickel or monel kettles, including stationary and tilting types. 2p.—Lee Metal Products Co., Philipsburg, Pa. (318)

**Nitrogen Atmosphere Generators.** Includes features, applications, and installation methods of packaged units. 4p.—Gas Atmospheres, Inc., Cleveland. (319)

**Blancher.** Gives features and specs for adjustable split-nut models. 2p.—Jebez Burns & Sons, Inc., N.Y.C. (320)

**$CO_2$ Slaughter.** Describes quiet and efficient method of immobilizing hogs for humane slaughtering. Cardox Div., Chemetron Corp., Chicago. (321)

**Milk Powder Sifter.** Details data for equipment in sanitary, high through-put screening of powders. 6p.—Entoleter, Inc., New Haven, Conn. (322)

**Gyratory Screen.** Operating advantages of redesigned stainless steel model are detailed, including application and installation data. 6p. — Allis-Chalmers, Milwaukee. (323)

### PACKAGING

**Filler.** Details 16-head rotary unit handling containers up to 3-in., at speeds to 180/min. 2p.—Pneumatic Scale Corp., Quincy, Mass. (331)

**Coder.** Describes Porelon plastic roller which eliminates need for fluid inks, solvents, ink fountains, etc. 4p. — Thomas Engineering Co., Skokie, Ill. (332)

**Canning Equipment.** Details complete line needed to set up soft drink canning operation in three speeds—150-300, 300-500, and 500-750 cans/min. Includes syruping, pre-mix, and processing systems. 40p.—Continental Can Co., N. Y. C. (333)

**Tetrahedron Packages.** Illustrates features of plastic film units for single-portion jams, jellies, mustard, ketchup, etc., in sizes ⅛-8 fl. oz. 4p. — The William Steven Co., Los Angeles. (334)

**Polyethylene Packagers.**

Describes portable, low-cost unit for handling Poly bags in widths from 2-24-in. 4p. — Sealaround Corp., Chicago (335)

**Case Sealers.** Illustrates compact, easily - adjusted unit with feed-in packing stand. 4p.—National Equipment Corp., N. Y. C. (336)

## MATERIALS HANDLING

**Fork Lift Trucks.** Two bulletins illustrate models in 2,000-10,000-lb. and 3-000-8,000-lb. capacities. 8p. — Allis Chalmers Mfg. Co., Milwaukee. (368)

**Malt Handling System.** Describes extra long pneumatic operation that allows bulk materials purchase. 4p.—Fuller Co., Catasauqua, Pa. (369)

**Lift Truck Masts.** Provides specs of 2,000-3,000-lb. capacity models of gas-powered trucks. 4p. — Yale & Towne Mfg. Co., Philadelphia. (370)

**Industrial Trucks.** Describes line of advanced models. 12p.—Automatic Transportation Co., Chicago (371)

**Truck Cost Analyses.** Four bulletins provide library of cost histories, studies, and formulas. 62p. — The Electric Storage Battery Co., Philadelphia. (372)

## SANITATION & MAINTENANCE

**Rodent Control.** Describes use of black light to detect invisible contamination of food products. 4p. — Black Light Eastern Corp., Port Washington, N. Y. (347)

**Gas Diffuser.** Covers operation and application of new gas-to-liquid transfer equipment. 10p.—Yeomans Bros. Co., Melrose Park, Ill. (348)

**Dairy Cleaning.** Details equipment and procedures for cleaning — in-place of dairy plants. 8p.—Oakite Products, Inc., N. Y. C. (349)

**Fumigant Recirculator.** Describes portable unit for grain bin fumigation. 6p. — Ferguson Fumigants, Inc., Ferguson, Mo. (350)

**Liquid Acid Cleaner.** Describes all-purpose material for equipment cleaning. 2p. — Wyandotte Chemicals Corp., Wyandotte, Mich. (351)

**Building Maintenance.** Manual supplies information on general floor surface care. 28p.—S. C. Johnson & Son, Inc., Racine, Wis. (352)

## INSTRUMENTS

**Temp Controllers.** Details electronic indicators with thermistor sensing. 4p. — Fenwal Inc., Ashland, Mass. (378)

**Limit Controls.** Describes wide range of recording, indicating and non-indicating, high and low limit instruments. The Partlow Corp., New Hartford, N. Y. (379)

**Electrical Input Control.** Describes uses of bimetal regulator for candy processing, canning equipment, etc. Robertshaw - Fulton Controls Co., Indiana, Pa. (380)

**Recorder.** Details Multipoint unit allowing fast changes from 2-24 points. 4p. — Minneapolis - Honeywell Regulator Co., Philadelphia. (381)

## INGREDIENTS

**Dry Seasonings.** Describes new form of spice ingredients prepared from pure natural essential oils a/o oleo resins, providing long shelf life, easy dispersion, stable emulsions, and flavor uniformity and constancy. 6p.—Dodge & Olcott, Inc., N. Y. C. (361)

**Industrial Proteins.** Details uses for alcohol soluble protein (Zein G-200), and mild aqueous alkali dispersible protein (Zein G-210). Includes nature, properties, solubility, preparation, etc. 34p.—Corn Products Sales Co., N. Y. C. (362)

**Pectinase Enzymes.** Describes enzyme formulation (Kerzyme) for rapid and effective depectinization, as in clarification and extraction of juices. 8p.—Wallerstein Co., Staten Island, N. Y. (363)

**Antioxidants.** Details characteristics, application, evaluation, and handling of food grade ingredients (Tenox). 32p. — Eastman Chemical Products, Inc., Kingsport, Tenn. (364)

## MARKETING

**Mass Retailing Trends.** Analyzes shifts in distributor operations and possible effect on manufacturers' marketing program. 66p.—Doyle Dane Bernbach, N.Y.C. (391)

**Home Baking.** Survey measures teenagers' use of prepared mixes, frequency of home baking. 7p. — *American Girl* Magazine, N.Y.C. (392)

**POP Advertising.** Details what chains think of and want from, point-of-purchase aids. 4p. — Schneider Press, N.Y.C. (393)

**Family Market.** Explains 1,000 - member household panel used for market research. 1p.—National Family Opinion, Toledo 1. (394)

**Export Aids.** Shows how government can help small firm tap overseas sales. 4p. — Small Business Administration, Washington 25, D. C. (395)

**Honest Advertising.** Guide book briefs government rules and acceptable practices as help for ethical advertising. 50p.—Advertising Federation of America, N.Y.C. (396)

## MANAGEMENT

**Metal Furniture.** Illustrates and describes line of furniture for institutional use. 28p.—The Howell Co., St. Charles, Ill. (383)

**Research & Development.** Describes firm's services in product development and manufacturing. 12p. — Arthur D. Little, Inc., Cambridge, Mass. (385)

**Typewriters.** Illustrates and describes features of restyled models (R 9041). 8p. — Remington Rand, N.Y.C. (398)

**Foreign Research & Advice.** Details overseas economic research services. W. S. Lockwood, Inc. (386)


**SALE OR MERGER MAJOR INTERNATIONAL SUPPLIER TO FOOD PROCESSING FIRMS**

Old line company with active sales branches in the United States and in many foreign countries. Completely modern plant and equipment. Major accounts of several years standing throughout the United States. Annual sales in excess of $1,000,000.

DIRECT INQUIRIES TO: P.O. Box 2725, Grand Central Station, New York 17, New York.

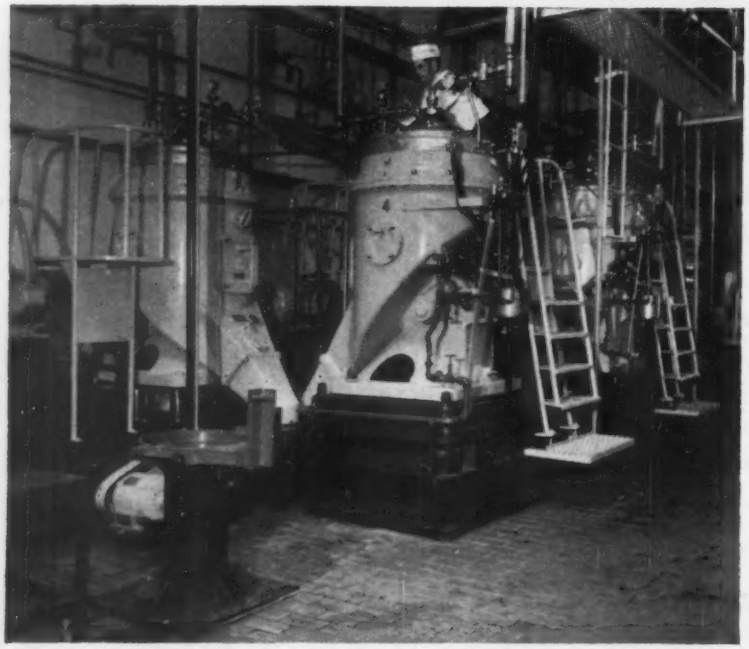
**FOR NEW ANGLES IN PROCESSING**

This close tolerance continuous mixer represents a major refinement in processing machinery. It is specifically designed for continuous flow operation. Inner members are stainless and it is equipped with heating or cooling jacket. We will be pleased to consider your handling problems. *Write for free brochure.*

ANTHONY

WILLIAM A. ANTHONY ENGINEERING COMPANY
9716 Madison Ave., Cleveland 2, Ohio

# FLUIDICS* AT WORK



## Continuous centrifuging improves juice quality without sacrifice in yield

At Pasco Packing Co., Dade City, Fla., these four Pfaudler Titan centrifuges are the key to producing juice having the high quality of a single light-finish, without any sacrifice in yield.

Under Pasco's new procedure, solids from the first finish are countercurrent-washed four times to recover additional sugar solids. Centrifuging the juice derived from these washings removes unwanted fine solids, detrimental to quality. By eliminating heavy finishing, Pasco no longer presses undesirable ingredients from the pulp. Centrifuging also avoids aeration and thus improves shelf life of the concentrate.

**VERSATILITY.** Since the Titan can continuously remove pulp from extractor juice with solids as high as *28% by volume,* juice processors have flexibility to meet process changes caused by seasonal variations in the fruit.

The Pfaudler Titan puts 7800 times gravity to work for you. This, along with a choice of disc sizes, makes separation of any size particle up to 1/8" diameter possible. And the Titan operates *continuously,* ejects sludge automatically in 5 seconds or less.

**OTHER USES.** Processing citrus juice is one application for the Titan's many unusual features. There are others. For example, the "Selecteject" control provides *solids only* discharge while maintaining a sludge blanket at the bowl periphery. This is useful with slimy solids where maximum dewatering or concentration is required. "Selecteject" also lets you handle coarse, compacting, granular solids with instantaneous, complete discharge.

**TEST PROGRAM.** Let us test your product in your plant with a Pfaudler demonstration unit, or at Pfaudler's Test Center. For more information, ask for Bulletin 946. Write our Pfaudler Div., Dept. FE-70, Rochester 3, N. Y.

*FLUIDICS is the Pfaudler Permutit program that integrates knowledge, equipment, and experience in solving problems involving fluids.

**PFAUDLER PERMUTIT INC.**

Specialists in FLUIDICS . . . the science of fluid processes


# USEFUL NEW BOOKS

## Dairying Guide

MILK PRODUCTION AND PROCESSING *by Henry F. Judkins and Harry A. Keener. John Wiley & Sons, Inc., 440 Park Ave., N. Y. C. 16. 1960. 452p. Price: $7.95.*

More important phases of the field are covered here in a broad but informative manner. Numerous illustrations and practical problems are included for facile understanding.

Among subjects discussed are: scope of the milk and milk product operation, essentials of successful dairy farm operation, components of milk and its secretion, testing for chemical and sanitary quality, various processing operations, and the nutritive value of dairy products.

While written in college text form, volume can be of value to many active in the field.

## Filtration Reference

HAND BOOK OF FILTRATION. *Pub. by The Eaton-Dikeman Co., Mount Holly Springs, Pa. 1960. 124p. Price: $2.50.*

Devoted exclusively to subject of paper filtration, this will make a valuable reference for lab technicians and process engineers.

Valuable and pertinent data are summarized, including several chapters of findings based on original research. Basic theory of fluid flow through porous media is developed, and paper permeability tests are described.

Layman is afforded a general review of the art and growth of filtration and an illustrated treatise on filtration equipment currently employing paper media. Glossary of terms and permeability characteristics of paperchart are also included.

## Industrial Plant Safety

FIRE PREVENTION AND PROTECTION HANDBOOK *by OTS, USDC, Washington 25, D. C. 1959. 180p. Price: $3.*

Basic fire prevention measures are covered, including requirements for construction, emergency, and protective features, and safe-

guards against common hazards.

Special hazards are discussed and general storage criteria noted. Manual was prepared by Navy for use in construction and maintenance of shore installations.

## Processing and Nutrition

NUTRITIONAL EVALUATION OF FOOD PROCESSING. *Ed. by Robert S. Harris and Harry von Loesecke. John Wiley & Sons, Inc., 440 Park Ave., N. Y. C. 16. 1960. 612p. Price: $12.*

Known effects of processing upon the nutrient value of foods are evaluated here and changes are suggested to minimize any possible loss.

Information gleaned from 33 authors, experts in various areas of the industry, makes this volume one of the most comprehensive and authoritative studies published.

Areas of concentration include nutritional effects of processing fruits and vegetables, cereals, milk products, meat, and other foods. Relation of packaging materials to maintenance of nutritive value and effects of cold storage are also considered.

## Booklets & Reports

STANDARDS FOR PREVENTION OF DUST EXPLOSIONS. NO. 657—CONFECTIONERY MANUFACTURING PLANTS. NO. 656—SPICE GRINDING PLANTS. NO. 62—SUGAR & COCOA *National Fire Protection Assn., 60 Battery-March St., Boston 10. Prices: 40¢ each.* Provides codes for industrial plant protection.

OFFICIAL ANALYTICAL METHODS OF THE AMERICAN SPICE TRADE ASSN. *ASTA, 82 Wall St., N. Y. C. 5. 1960. 45p. Price: $5.* Contains 21 different procedures for evaluating quality in natural spices.

MEASURES OF OPERATING EFFICIENCY IN WHOLESALE FOOD WAREHOUSES. *Mktg. Report No. 399. Office of Information, USDA, Washington 25, D. C.* Explains efficient and economical methods of warehouse operation.

DIRECTORY OF CONSULTANT MEMBERS OF AMERICAN MANAGEMENT ASSN. AMA, *1515 Broadway, N.Y.C. 36. 1960. Price: $1.50 to members.* Valuable reference breakdown of management specialists.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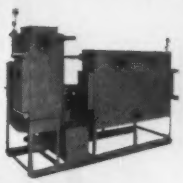

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**Sesame Seed Product** Impregnated With Extraneous Flavoring Substance.—T. F. Riddle, Freeport, N.Y. No. 2,926,091.

**Antioxidant** Comprising Synergistic Combination of 2,6 di-tertiarybutyl-p-Cresol and Butylated Hydroxyanisole. — L. R. Dugan, Jr., Chicago. No. 2,926,092.

**Pudding Mix** Containing Pre-Gelatinized Starch, a Tetra-Alkali Metal Pyrophosphate and Alkali Metal Salt of Carbonic Acid. — H. J. Charie, Thomas J. Lipton, Inc., Hoboken, N.J. No. 2,927,861.

## PROCESSING

**Producing Coffee Extract** In Dry Powder.—R. O. Blench, E. Griffiths Hughes, Ltd., Salford, England. No. 2,918,372.

**Subjecting** Pasteurized Milk To Ultrasonic Treatment, Then Freezing — W. G. Wearmouth, Reading, England. No. 2,918,380.

**Cheese-Like Product** by Combining Vegetable Fat With Sucrose - Containing Oil-Free Nut Extract, Homogenizing, Cooling, Inoculating and Forming Curd That's Drained, Pressed and Ripened.—N. S. Berntsson, Goteborg, Sweden. No. 2,919,193.

**Cooling** Pre-Cooked Fish Prior to Canning In Air-Free Zone With Moisture Introduced to Maintain Humidity.—R. T. Erickson, Star-Kist Foods, Inc., Terminal Island, Calif. No. 2,919,987.

**Mixing Cracker Dough,** Discharging it to Fermentation Chamber Where It's Formed Into Thin Sheets For Delivery To Oven. — E. T. Oakes, Islip, N. Y. No. 2,920,964.

**Cheese-Flavored** Baked Goods by Adding Enzymatic Yeast Digest to Dough, Then Baking.—H. F. Ziegler, Jr., Anheuser-Busch, St. Louis. No. 2,920,965.

**Irradiating Foods** With Gamma Rays.—E. S. Stoddard, General Electric Co., N.Y.C. No. 2,920,969.

**Preparing** Agglomerated Milk Powder Without Rewetting. — P. F. Sharp, Dairy Foods, Inc., Los Angeles. No. 2,921,857.

**Retarding** and Accelerating Ripening of Vegetables by Storing in Gas-Tight Room, Subjecting to Various Gas Treatments. — F. Bonomi, Milan, Italy. No. 2,923,629.

**Stuffing Dressing** into Poultry, Using Hopper-feed Combined with Scroll. — E. Bonami, Swift & Co., Chicago. No. 2,923,630.

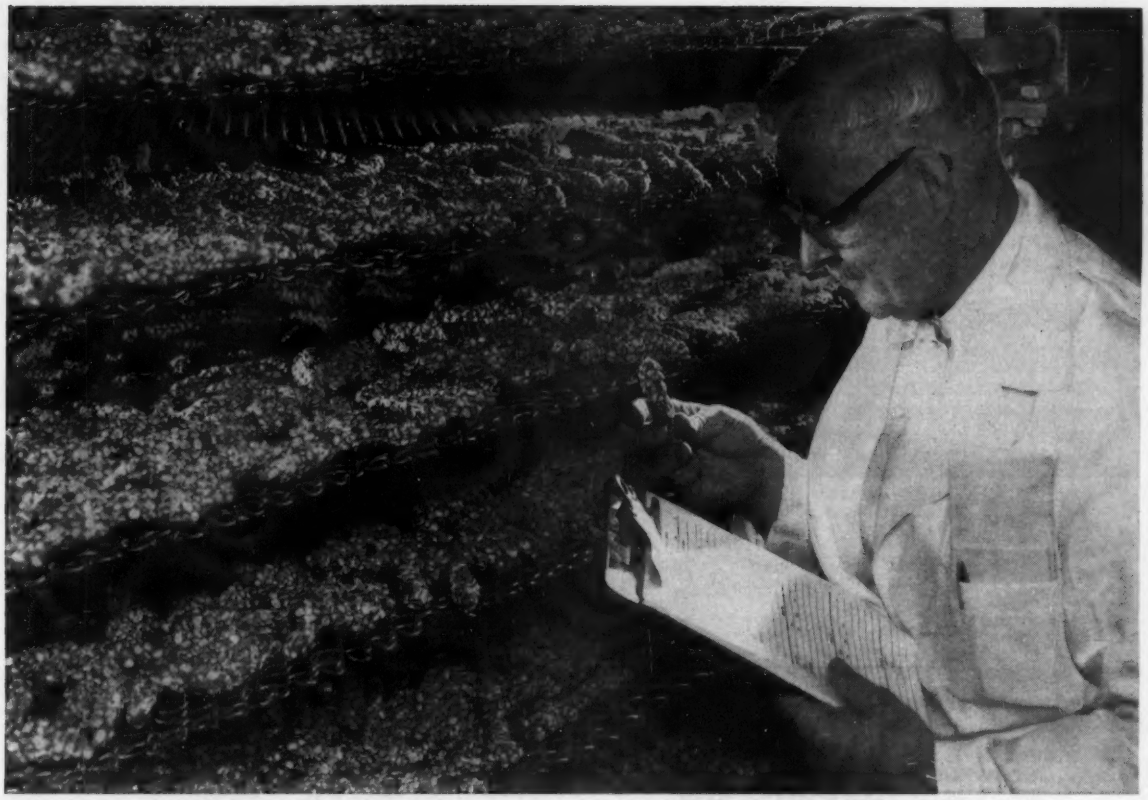
## PACKAGING

**Device** for Sequentially Evacuating Space Between Product and Package, Drawing Package About Product to Flatten Wrinkles and Sealing.—S. R. Grinstead, Swift & Co., Chicago. No. 2,918,767.

**Machine** for Receiving Stacked Envelopes and Adapted to Rotate with Tube Into Which Air Is Forced As It's Conveyed Past Product-Feed Station. —L. R. Wickliff, Armour and Co., Chicago. No. 2,918,771.

### A-RAYS CORRECTION

Temperature to which radiated salt was heated to remove discoloration is 400C., not 40C. (Page 61, June FE).—The Editors.



Mr. Irving Bessner checks the candy on a 170-foot USS Cyclone Conveyor belt.

Mr. Henry Schuemann, Assistant General Superintendent for all plants of the Curtiss Candy Company, Chicago, Illinois.

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## *Recent Inventions*

**Continuously Wrapping Gas-impervious Flexible Sheet Around Cheese to Form Elongated Tube, Introducing Inert Gas, Collapsing and Sealing.**—H. G. Podlesak, National Dairy Products Corp., N.Y.C. No. 2,919,990.

**Nozzle-Filling Liquids In Plastic Bag Within Suporting Carton to Prevent Entry of Air, Then Sealing.**—B. Heinemann, Producers Creamery Co., Springfield, Mo. No. 2,920,967.

**Device for Removing Improperly Filled Containers from Line Comprising Rotatable Turret with Radially Disposed Extensible Arms.**—C. W. Osmond, Karl Kiefer Machine Co., Cincinnati. No. 2,922,445.

**Forming Material in Continuous Strip with Closed Bottom and Open Top, Sealing and Cutting into Bags, Filling and Sealing Top.**—D. P. Selock, Roto Wrap Machine Corp., Englewood, N. J. No. 2,923,111.

**Time-Cycled Machine for Filling and Closing Cartons.**—C. B. Harker, Bartelt Engineering Co., Rockford, Ill. No. 2,923,112.

**Unit for Evacuating Gases from Paperboard Cartons Packed with Wrapped Cheese.**—R. E. Miller, National Dairy Products Corp., N.Y.C. No. 2,923,114.

## EQUIPMENT

**Conveyorized System for Pre-Cooling and Super-Chilling Perishables in Insulated Shipper Containers.**—W. L. Morrison, Union Stock Yard & Transit Co., Chicago. No. 2,901,891.

**Mixer Comprising Connected Auxiliary and Mixing Chambers with Gas Supplied to Both to Equalize Pressures Above Contents.**—R. Hepburn, Morton Machine Ltd., Wishaw, Scotland. No. 2,901,988.

**Device for Forming Cheese Slabs Interleaved with Dividers.**—B. E. Meulemans, Swift & Co., Chicago. No. 2,902,804.

**System for Pickle-Pumping Meats Consisting of Scale and Ratio Relay for Shutting Off Solution When Pickle Weight is Reached.**—O. Rice, Hagen Chemicals & Controls, Inc., Pittsburgh. No. 2,915,958.

**Valve-Type Structure for Dispensing Heavy Consistency Fluid.**—J. Kollman, Kitchens of Sara Lee, Inc., Chicago. No. 2,917,272.

**Continuous Flow Cheese-Making System.** — M. P. Lankford, Mendota, Ill. No. 2,917,827.

**Cutter for Severing Looped Ends from Strips of Dried Macaroni and Spaghetti.** — I. Senzani, Faerza, Italy. No. 2,917,959.

**Fruit Orientator, Splitter and Pitter.**—T. B. Keesling, Canning Equipment Co., Olympia, Wash. No. 2,918,-098.

**Radio-Frequency Unit for Drying Spaghetti Products.**—A. Schrenk, Gebrueder Buehler, Uzwil, Switzerland. No. 2,918,728.

**Machine Comprising Spindle Along Which Individual Cored Fruits Move for Slicing by Gang of Disk Knives Spaced Around Spindle.**—J. U. Waters, Hawaiian Pineapple Co., Honolulu. No. 2,-918,957.

**Blending and Heat-Exchange Mill for Flowable Materials.** — J. J. Fischer, Patterson-Kelley Co., E. Stroudsburg, Pa. No. 2,919,-116.

**Molder Comprising Horizontal Conveyor Carrying Dough Pieces Through Inverted U-Shaped Cylinder and Horizontal Rod to Form Dumb-Bell Shaped Twin.**—F. D. Marasso, American Machine & Foundry Co., N.Y.C. No. 2,919,664.

**Elongated Brine Tank with Upper and Lower Flow Channels for Quick-Freezing Buoyant Foods.**—L. A. Roser, Salt Lake City. No. 2,920,462.

**Apparatus for Pressure Sterilizing Products in Sealed Containers.** — L. E. Kaap, Food Machinery & Chemical Corp., San Jose, Calif. No. 2,920,552.

**Egg-Breaking Machine.**—C. H. Willsey, Topeka, Kan. No. 2,921,667.

Want more information on any of these recent patents—if so you many obtain detailed printed copies by writing direct to The Commissioner of Patents, Washington 25, D. C., giving serial number of those you want and enclosing 25¢ for each copy.

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Pulper: FMC MC-664, 30 hp.
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2—Buflovak 42" x 120" atmospheric double drum Dryers.
4—Sweetland Filters, #7, #10, #12.
1—Devine Vacuum Shelf Dryer, 10—40" x 43" shelves.
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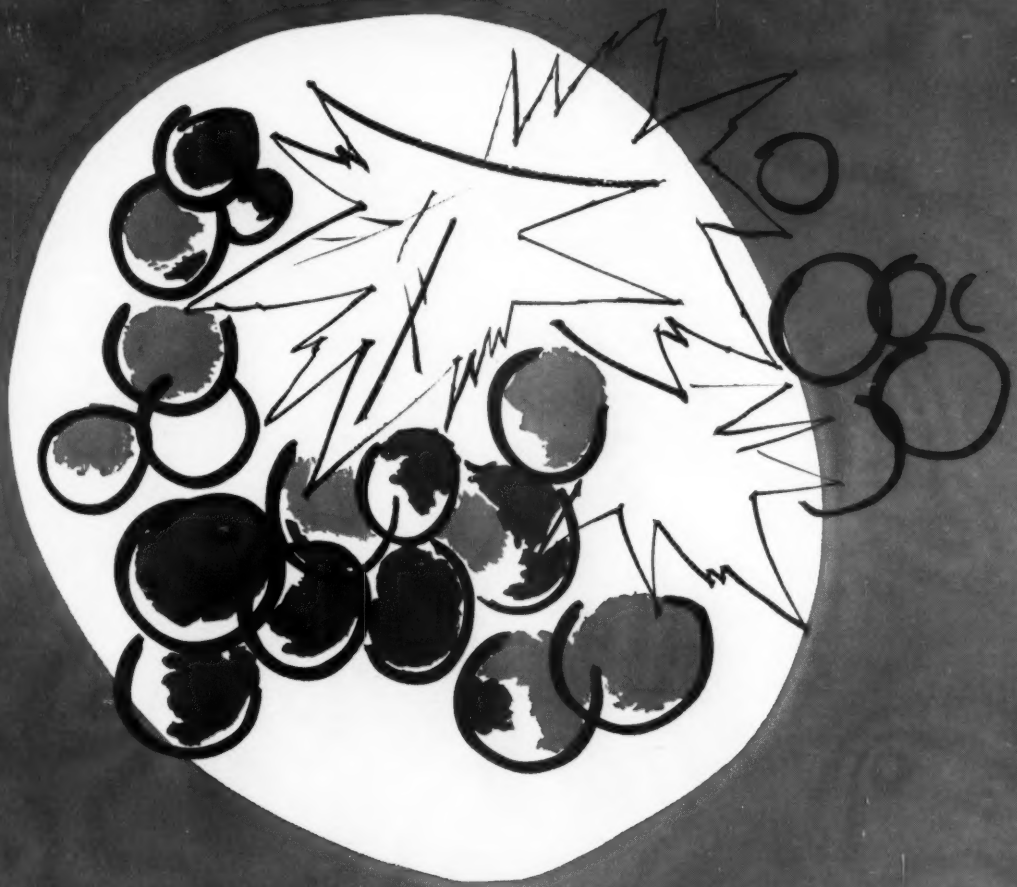

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